TIME STANDS STILL

New Light on Megalithic Science

by Keith Critchlow
Colour Photographs by Rod Bull

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'Who am I, who
Speaks from the dust,
Who looks from the clay?

'Who hears
For the mute stone,
. . . . . . ?'

from the poem '*Self*'
by Kathleen Raine,
Collected Poems, 1972

'Night comes, an angel stands
Measuring out the time of stars,
Still are the winds,
And still the hours.'

from the poem '*Nocturne*'
by Kathleen Raine,
Collected Poems, 1972

To Motherhood
in gratitude –
and to the anonymous masters
of the Megalithic Monuments
of Britain

And in particular to
Wendy Stewart, Gail,
and the helpful children Louise, Amanda,
Mathew and Amelia

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Preface

Professor R. J. C. Atkinson, the renowned authority on the archaeology of Stonehenge on which he has been working at intervals since 1950, says of the discipline he represents:

> **'We thus have the paradoxical situation that archaeology, the only method of investigating man's past in the absence of written records, becomes increasingly less effective as a means of inquiry the more nearly it approaches those aspects of human life which are more specifically** *human***'.**
> Note from the book *Stonehenge* by R. J. C. Atkinson p. 169

If archaeology cannot by its nature deal effectively with the specifically, or might we say essentially, human aspect of its subject then we take it that this does not mean that 'archaeology' wishes the 'human' to be neglected – rather that it cannot in its own terms deal adequately with it. We also take it that the essentially human aspect of such an important matter as our 'origins', or rather the origins of the making of 'permanent' structures, is too significant to be neglected. Therefore we offer our findings as complementary to archaeology, and have approached the subject from an architectural discipline with a philosophical perspective based to the best of our understanding on traditional values.

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Introduction

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Our unquenchable thirst for knowledge of our origins lies in the intuition that we feel the clue to our destiny lies hidden in our origins. A birthday celebration expresses this as much as Darwin's elaborate 'Origins of the Species' theory. The great creation myths* of humanity epitomize our need to transmit our roots and give original meaning to existence. The value of creation myths lies in their effectiveness, not in their logicality. Myth is an inspired way of transmitting and maintaining those essential values and truths which each society deems vital. Only through myth can the expressive, poetic, intellectual and inspirational levels of the mind be united in the symbolic. Our fascination for the dignity and mystery of the megaliths stems from the recognition of our own mute 'creation myths' in stone. Their very presence seems to pose the perennial question, 'what does it *really* mean to be human?'

Those of us who are part and product of Western technological culture – significantly the minority of the current human family – despite our inordinate greed for energy and materialism, find ourselves in an exceptional phase of the life of humanity. We are unwittingly taking part in the anomaly of attempting to conduct society without the metaphysical or spiritual dimension. It is that very dimension which addresses itself to origins and destiny and humanity's overall relationships with our universe or the 'whole'. Because of the distractions of technological 'magic' and its obvious material advantages, we have failed to achieve a wholeness in industrial or post-industrialized society. The paradoxes of increased material wealth and energy greed, natural resource destruction and the increase of mental illness all point to the fact that never before in human history has a culture been attempted without a spiritual dimension; in fact one could go further and suggest that a society is not correctly definable as 'human' without such a dimension.

The sad modern prejudice against 'religion' is due to the lack of differentiation between an individual's 'experience of religion' and 'religious experience'. Tradition is *certainty* orientated whereas modern 'replacement' theories support the doctrine of uncertainty, thereby giving uncertainty itself an absolute value; which is a simple contradiction of meaning. There can be no such thing as *un*certainty (as it is the 'lack of') if certainty doesn't exist first. We are not, in modern times, usually made aware of the significance of the choice between believing in certainty or uncertainty. For instance, Heisenberg doesn't ask us to be uncertain that there is a phenomenon which we call an electron; he tells us only that we can be sure that *its exact whereabouts* is *uncertain* at any given moment. His 'uncertainty principle' is naïvely cited by some as if it were a *philosophical* truth. In fact it only points to the impossibility of an empirical absolute – which accords with the metaphysical tradition.

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* We uphold the traditional sense of the term myth, which is a relating *in time* matters which are essentially timeless; matters which are central and psychological and spiritually accurate, yet not by their nature expressible in literal (a=a) terms, as they deal with the essential meaning of being human. Needless to say Darwin's theory of the Origin of the Species is a myth in the modern sense of a partial and plausible thesis *in time* only.

The consensus traditions of mankind all indicate metaphysical dimensions, which we could call our spiritual heritage and without which life on earth is meaningless.

In *Science and Civilization of Islam*, S. H. Nasr. speaks eloquently of the traditional meaning of knowledge from the Islamic perspective (gnosis), which was to be considered either as 'worldly' (empirical), concerned with the realm of becoming and change (uncertainty) or as 'heavenly', permanent, archetypal and immutable (certainty). The former was the basis of *scientia* and the separate sciences, and the latter of *sapientia*, an essential level of knowledge of being. Nasr describes sapientia as 'A knowledge that illumines the whole of the being of the knower'. One can see how confusion has penetrated so-called 'modern philosophy' in that it allows equal status to relative opinions in the search for certainty. This competitive marshland of relative opinions has resulted in truth itself being questioned as a value. Leaving a residue of relative falsehood?

The sun and the moon are the two primary pacemakers of all biological existence, whilst at the same time they are the prime symbols of permanence and cyclicity. Therefore it is not surprising to find these two immediately attendant as foci of orientation both physically and metaphysically in the establishment of the human sanctuary—the temple. There is no reason whatsoever to consider the stone circles of Britain other than temples in the true meaning of the term.

Similarly the word origin is grounded in the early word *orire*, to rise as the sun, hence the link with east, or orient, and orientation: the direction of the new-born light. Lucid (clear, accurate), luminous and lunar come from the same source.

Professor Thom's findings have implicitly indicated the employment of Pythagorean triangles by megalithic temple-building man quite a millennium before Pythagoras lived. There is a remarkable parallel between these findings and the recent decipherment of certain Babylonian clay tables which, coincidentally, are of about the same date as the stone circles. There is a particular tablet in the Plimpton Library of Columbia University, New York, which until recently was lumped together with many others under the loose title 'Commercial Tablets'. Yet this tablet, when analysed by a mathematical authority, revealed quite startling and totally unexpected results. These results have a direct relation to Professor Thom's findings, as the tablet contained sets of pairs of Pythagorean triplets: this means two of the sets of three side lengths of Pythagorean triangles. A Pythagorean triangle is a three-sided figure with one angle a right angle of 90° and with side lengths which are whole numbers; the third number can be ascertained if the other two are given. The startling facts of these number sets is that they would seem to indicate a quite different approach to and understanding of the nature of number and geometry from our own. We, for instance, would immediately resort to algebra, trigonometry or our pocket calculator to manipulate numbers like 12,709 and 18,541 to find the Pythagorean triplet of 13,500, as their squares, which are necessary to know, run into millions*; yet there can be little doubt that algebra was unknown in pre-Christian times.

From the power over 'number-theory' that the fifteen Pythagorean triplets

l and $18{,}541^2=343{,}768{,}681$,
250,000. So that 343,768,
182,250,000; as $a^2+b^2=c^2$

*
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implies the Mesopotamians possessed, certain questions must arise. As they are handling a general rule which is well known to them, we cannot deny them the ability to express the generalization that $a^2 + b^2 = c^2$ yet they never do so. There must be a good reason for this.

Two obvious reasons come to mind: (a) that the mathematicians did not wish others to know of the generalizations, or (b) that there was *no need* to express them in abstract form. The latter solution would imply that, for the people of that era, actual numbers conveyed some sort of immediate perception of the general relationships existing between these numbers.

Whatever we choose to believe, their ability to handle Pythagorean triplets cannot be doubted, as the evidence is concrete; the implications are, however, that such ability indicates a familiarity with:

The number theory (principle) of Pythagorean triplets
The geometry of right triangles
The arithmetic of squares and roots of large squares
The elements of trigonometry, and
The number theory of sexagisimal expansion

—and all this without algebra.*

Measure and Number are the two keystones of logical or quantitive reasoning. Number, we can say, was the main concern of these Mesopotamians, whilst measure was that of the Egyptian civilization; our current knowledge of the Megalithic Briton is that he was concerned with both. Of the Egyptians and Babylonians Professor John Kreitner has said, 'for the foremost achievements of their time, we have no record of method; we only know that they knew it, and that they lacked the *formal* tools of mathematics. Hence their very achievements imply a greater depth of intuition than the modern mind is capable of, and hence willing to concede.'

It is because intuition represents just this antithesis to analysis that it is so suspect to our own times. We hope to demonstrate during the course of the book that it is just this remarkable balance between the intuitive and the logical that is to be found in the British megalithic artefacts and monuments that have come down through time to us today.

We also hope to take a new look at the techniques used by primordial societies—as distinct from sophisticated ones—called by the too general term Shamanism. Perhaps our studies will show them to be techniques that enable not only the intuitive mind to be brought into play, but into greater depths of consciousness than, to use Professor Kreitner's phrase: 'the modern mind is capable of, hence willing to concede'. Maybe we should say 'willing easily to concede', as there is increasing evidence of an interest by modern Western psychologists in the realms of traditional psychology as represented by the Hindu Yogic tradition, the Buddhist meditative tradition, the Islamic Sufi tradition as well as the Christian contemplative tradition, and the archaic techniques of 'gnosis', or knowledge of the self, upon which traditional societies base their view of the world.

Starting from the unity of existence considered as the prime characteristic of a traditional society, the indications are that the distinction between a temple and an observatory is unnecessary when considering the stone circles.

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* There is however a geometric solution to these triplets, according to Robert Lawlor, intended to be published in relation to musical scale theory.

Since it is not in doubt that the builders were what is ordinarily meant by a traditional society, it is more fruitful to attempt to put the conceptual evidence together with the evidence from stone circles themselves and to see what results emerge.

But at this point it is necessary to pay tribute to the heroic feats of surveying of Professor Alexander Thom, who made it possible to relate my own work as a geometer and architectural proportionalist directly to the arrangements of the megalithic structures.

It is not so surprising that the members of the archaeological community were so reluctant to listen to, let alone accept, the findings of Professor Alexander Thom with regard to the *geometric* structure underlying the stone circles of Britain. Even though he presented these findings in the most scientifically accurate way, this only served to make the effect one of 'delayed action', as the community was not able to test all the mathematics and professional surveying immediately. On top of this there were inbuilt prejudices against the possibility of a pre-literate and therefore presumed pre-numerate society being capable of such mathematical activity. Another curious prejudice seemed to rest on the grounds that astronomical alignments meant 'observatory' and therefore not 'temple', and implied loss of the religious motivation in the megalithic society. Such either/or logic is significantly a 'modern' division, as we hope to show during the course of the book, and therefore not likely to arise in the mind of the builders.

On the other hand, the long-held view was that these 'rude' stone structures were clumsy erections of primitive 'wild' peoples and therefore not worthy of further consideration, apart from the energy they expanded on humping them about. The exception was Stonehenge, which was constantly 'excused' on the grounds that the Romans or the Myceneans or the people of some other Mediterranean civilization were responsible. This attitude served to block our perception of the beauty and subtlety of these arrangements and of the stones in themselves.

This book was the result of being invited to join forces with Rod Bull, whose exceptionally intuitive and inspired images of the British stone circles were shown to us, and to present the accumulated research work of my own years of studying the same structures.

The sensitive work of Rod Bull, who succeeds in bringing out the essential and particular qualities of each stone and each setting, is evidence of a changing awareness of the beauty embodied in the arrangement and form of these massive stones. It is an awareness educated during the last century by our European contact with the great religions of the Orient, and quite specifically the 'timeless' sand and rock gardens of the Japanese Buddhist monasteries. Bull's images are not only evidence of the years dedicated to travelling the length and breadth of the British Isles to record the mysterious beauty of these monuments; they open up to all of us the majestic power and individuality of the stones that were so obviously chosen and placed with such care and particularity. These photographs are works of insight which capture some of the intuitive imagination and understanding of the original builders, and serve as a magnificent complement to our tendency to over-intellectualize such creative achievements.

Chapter 1 The Enigma of the Megaliths

'A man who has lost his sense of wonder is as a man dead.'
'Logic can take you from A to B, but imagination encircles the world.'
Albert Einstein

'What a true symbol teaches is not subject to the limitations of verbal expression.'
Frithjof Schuon[1]

'When traditional man looked at the stars he saw in the heaven of the fixed stars the limits of the universe. Beyond that heaven was not "space" but only Divine Presence. This finite cosmos, however, was far from being a prison without an opening. On the contrary, by the very fact of its finite form it served as an icon to be contemplated and transcended. Thanks to its symbolism, the concentric spheres acting as a most powerful and efficient symbol for the states of being which man must traverse to reach Being Itself, the content of this cosmos was infinite and its finite forms like the forms of religion led to an inner content which is limitless.'
S. H. Nasr[2]

'What is here is there, what is not here is nowhere.'
Vishwasara Tantra[3]

Origins

The challenge of the great standing stone monuments of Britain increases with each new study. This is due to both the greater accuracy of new scientific instrumentation and the change in modern ideas about what it means to be human.

There is a revolution in prehistory, as it has been called, affecting the current attitudes towards it. In other words, there is a 'turning round' and broadening of today's use of the terms 'history' 'human nature' 'scientific' and even 'philosophy'. These terms are less watertight and strictly compartmented as they were even ten years ago, let alone in the flood-tide of 'Darwinism' and 'positivism' of the 1920s and 30s.

This turning around of modern thinking is not due solely to the facts of the past as they have emerged, but it is influenced to a greater or lesser degree by the scale of events in which our science-dependent society has found itself. Atomic and nuclear weapons are one aspect, ecological disasters and the relationship between population expansion and natural resources are another; the 'energy crisis', so-called, is a third. These problems have penetrated the most buried of scholarly fields as our collective sense of 'progress' and 'rightness' is challenged. Who can responsibly *define* a post-industrialized society?* The emergence in the contemporary scientific community of groups concerned with the social responsibility of science is a clear indication of this change in mood.

It is significant that more and more scientists and scholars are realizing that it is they themselves who are the ultimate instruments by which all their data, however processed, must be evaluated. This implies that the personal psychology, upbringing, circumstances and state of being of the observer colours the observed – even when the 'observer' is a team. Facts alone, however logical, are apparently not enough; their context, their application in society and a value system to monitor both are simultaneously vital and necessary. And all this hinges on what it really means to be human.

It is not only the balance of nature that has suffered from our 'modern' industrialized culture with its mechanistic and materialistic criteria but, possibly most important of all, we have suffered the loss of dignity and self-confidence by this same mechanistic attitude toward human nature.

However well-meaning aid to traditional societies may have been, it inevitably brought with it a dependency – political, economic and ideological – on the incoming new techniques, thereby disastrously affecting the traditional 'wisdom-structure' of those communities.

Potential global nuclear war and non-renewable fossil-fuel consumption are in constant attendance, yet it may soon be realized that the greatest threat our modern industrial culture poses for mankind is the denial of its spiritual heritage or the value system to control these negative elements. What we will call traditional or perennial wisdom is the foundation of all human communities throughout recorded and non-recorded time. It not only sets out to relate the individual to the cosmic scheme of things, but predicates a relationship of health or 'wholeness' between the natural environment and fellow beings. It is only in this realm that the full dimensions of our dignity and humanity are to be found, as it is the very principle of unity.

We believe it is in just this dimension of unity that we have most to gain from our study of the megalithic monuments, as their origins in this sense are our origins.

We have a scientific technique, never infallible, but currently acceptable, telling us through its analyses that many of the architectural feats of the stone temples, burial tombs and stone circles of Western Europe *predate* the urban civilizations of the Middle East. It is therefore no longer viable to ascribe the influence or inspiration of Stonehenge or Silbury Hill to Asian cultures. Academic archaeology can no longer rely on the axiom that such feats of construction as the great stone temples of Malta, the magnificent corbelled domes of New Grange and Maes Howe, the great pyramidical cone of Silbury Hill and the immense structure of Stonehenge are the informed work of a 'literate' urban society. The man-power alone required to raise these monuments is astounding. † Yet there is no direct evidence of a slave-pressured society for their accomplishment.

Colin Renfrew, as one representative of contemporary archaeological thinking, freely admits that neither the independent evolutionary theory nor the diffusionist theory are sufficient explanations in themselves for the new facts.[4] Neither position explains the motivating impetus that gave rise to these monumental innovations. The current position seems to indicate that both phenomena occurred: the independent discovery of new techniques and practices *and* the diffusion and exchange of these through exploration, trading and the resultant interchange of ideas. What is most dramatically changed is the certainty, held until recently, that the inspiration and directives could only have come from the Levant to account for these great megalithic feats of pre-recorded history in Europe. What is significantly missing from either view is the will or spiritual perspective for such massive feats of construction, to which we will return.

There are certain human monuments that bear the quality of timelessness. We believe the stone circle temples of Britain are fine examples. Standing before or within any of these profoundly simple, yet striking arrangements, one is without the normal clues as to their significance. Why is one so affected? There is nothing written by the builders which could explain the presence of the structures. They become deeply challenging to our sense of both the practical and purposeful. To spend some time nearly two thousand feet up in the Welsh hills, shin-deep in snow, with a breathtaking panorama of constantly changing skyscape and light brings one very sharply up against one's own 'foreign-ness'. Yet one is standing in the habitat that was normal to the original builders. At this height the landscape is virtually the same, the weather, the nuances of the breeze, humidity, aromas, trees, birds and even animals to a certain extent, yet so few of us as urban town dwellers can 'read' these natural surroundings. One is faced with an overwhelming question: what is the intrinsic value of literacy and does *word* reading reduce our ability to read our natural surroundings? Is human wisdom only to be found in libraries, universities and technological wizardry? So many questions arise when one is put back into a natural perspective, humbled before a snow-covered hillside and overwhelmed by magnificent snow-laden clouds. One's humanity can be experienced as a natural *ingredient* of a whole phenomenon. No longer need it become a matter of intellectual effort, one is *part* of an experience. The questions of existence – existence both of oneself and of the nature of the whole of which one is a part – become far more important than speculations as to who did what, when and why. If these recorded experiences are becoming dangerously romantic for the 'factualists', then we recommend that they too visit the more isolated of our great British megalithic monuments. Having done so they might ask themselves how 'literate' they find themselves in relation to the essential facts and forces, that is the *language* of the natural order.

In the hope that some of our findings will help to stimulate a better and fuller perspective for the study of the monuments, we must turn from the general to the particular. There is a series of perennial human issues which if considered in the context of our present study will help our aim.

First there is humanity's inherent need for locating itself in space, time and culture. Colin Renfrew puts this into a particularly significant frame when he says: 'Dating is crucial to archaeology, without a reliable chronology the past is chaotic'.[5] It is to this perennial and archaic human need to cope with and combat the chaotic that we shall turn in our later material, as it would also seem to be a fundamental motive for the circle builders too.

Another 'innovation' that has recently been introduced to the conventional field of archaeology is the important technique of cross-cultural comparisons.

> 'Ethnographic comparisons can be misleading if too much is made of similarities and differences in point of detail; and indeed, to make too close an equation between prehistoric Orkney or Arran and modern communities in Borneo or New Guinea would be rather foolish. Yet the comparison helps us to see how small family communities, living not far above the level of minimum subsistence and with very limited technologies, can co-operate in impressive enterprises. In the same way small Neolithic communities could well, in the right social framework, create monuments which at first sight seem more appropriate to a great civilized state such as Egypt.'[6]

We find in this observation, as in other summaries of the conditions and social structure of the megalithic builders, that, important as they are, there is a neglect of the study of inspiration or *motivation*: what can only be called the spiritual dimension which is obviously primary, as it has been for the greatest history of all human societies. Nevertheless the monumental achievements *are* appreciated as an awe-inspiring fact.

Taking up the technique of cross-cultural comparisons Renfrew reminds us briefly, but significantly: 'They (the great statues of The Easter Islands) were regarded by the Easter Islanders as Vessels which the spirits entered when invited by priests', thereby putting into context what the builders and makers themselves intended for them.[7] Unfortunately Renfrew uses the term 'cult' when referring to the Easter Islanders' religious attitudes, which has the great disadvantage of being both unspecific and belittling, and placing negative overtones on what was obviously the central driving force of the whole community, namely its religion. Not only were the Polynesians capable of performing minor 'miracles' in recorded history through their religion, i.e. the walking on fire and passing metal through their bodies without bloodshed, but the whole issue of the bringing of 'Western technical culture' and its inevitable judgements to these beautiful Pacific Island communities is very much in question in many quarters today.

> 'The interest in generalization is perhaps the most important single feature of the new outlook in prehistory. It has made us realize how much the pre-historian still has to learn from the study of non-industrial societies.'[8]

This quotation characterizes our own position, as we believe that it can be shown that the fundamental inspiration for a pre-industrial society is its tradition* which is rooted in the psychological and spiritual realms – without forgetting Renfrew's parting remark: 'For obviously the task of reconstruction begins with the artefacts: they are the basic material.'[9]

An appropriate way to integrate the apparent differences between what could be called the 'domestic' or 'pragmatic' and the 'sacred' or 'transcendental' dimensions in any traditional community's affairs is to discuss the nature of *symbols* as contrasted to *signs* and *indications*. The artefacts we are going to investigate, including the stone circles, would appear to embody both these aspects.

At risk of over-simplification we might say the fact that the stones are standing is a sign, an indication, that people in the past erected them and the shape, placing and significance of those same stones were no doubt also symbols to those builders. By a true symbol we mean a truth that permeates the spiritual, intellectual, emotive and perceptive responses, both indicating and being part of the instrument that carries it – be it stone, metal or timber.

It is the recognition of the multivalent mature of a symbol as opposed to the simplicity or conventionality of a sign, that introduces the subject of comparative philosophy and comparative religion. Mankind's concern and need for symbols is an essential part of his humanity. This realm has been called the sphere of human depth psychology. Symbols have also been described as archetypal patterns emerging in both instinctive and inspirational lives of people, due to their common genetic ancestry. Others take the view that cultural patterns are a matter of environmental inheritance; certain collective behaviour patterns they believe to be the result of a cultural ethos, subconsciously and consciously conditioned into a psychology of each member during development. A third position is represented from within the religious dimension itself, one which complements and includes the previous two and is described by the term 'revelation'. This last perspective accepts the emergence into consciousness of those archetypal ideas that are of an order beyond the 'closed' individual system. In order to understand the ancient monuments we believe it is to this latter area that modern mind must turn.

The intellectual challenge that these megalithic monuments present to us is very much bound up with our own sense of what we take to be self-explanatory. The tendency is to make the stones fit neatly into either an 'irrational' religious or 'cultic' category, or a wholly rational 'observatory' category. The fact that there are such obvious contradictions to either of these extremes, if one or other is taken as providing the 'correct' answer, should warn us to be wary of our modern mental habits.

Direct experience of the stone circles arouses an immediate sense of drama, power, and concrete reality: we recognize a tremendous driving force. Because there are none of the normal associations of ego-aggrandizement the idea of the sacred inevitably arises. On the other hand the precise studies and hypotheses of Alexander Thom and others demonstrate what we can only call a 'scientific' motivation.[10] For our modern Western categorizing mentalities this tends to force a choice between the 'irrational' and 'rational' interpretations, when in fact there is every good reason to accept both. It is by reviewing the meaning and nature of *temple*, that we believe a solution emerges.

In an effort to regain or recollect the primordial sense of those ingredients which traditionally serve to make a place sacred, we have communities with pre-industrialized economies to turn to, particularly those who use megaliths as an essential part of their living tradition.

Maintaining our awareness of the dangers of apparent similarities between cultures which are by definition different, we proceed on the assumption that there are intrinsic human qualities that allow us to use collective terms.* On this basis we will look at three representative pre-industrial societies to seek their essential *motivation* for raising large stones, so far as records allow.

The first is the Minoan civilization, the second the Gadaba community of India and the third the Easter Islanders of the South Pacific.

At the turn of the century the great British archaeologist-scholar, Sir Arthur Evans, made discoveries in Crete which were to change current thinking completely regarding the early Mediterranean civilizations. The power and extent of the Minoan civilization were revealed after thousands of years of semi-legendary darkness. Current dating techniques have pushed the assumed dates further back than Evans would have dreamed and the height of Minoan civilization is now believed to have been contemporary with much of our British stone circle building.

It is thought that there was a relationship between the Minoans and the Mycenaeans of the Greek mainland. Both produced large and small stone buildings of an outstanding quality. There are remarkable similarities between the famous conical dome of Atreus at Mycenae, Scotland's Maes Howe and Ireland's New Grange, but it is Evans's conclusions about the Minoan proto-religion, which he studied in relation to the later classical Greek civilization, that are relevant here. He compared this religion of 'stocks and stones', as he called it, with other early religions, and he pointed out that survivals of the early ritual techniques are to be found in the stones which evolved into the sculptured images of the inhabiting divinity. Instances of this are Apollo with his laurel wreath (a symbol of vegetative life) and the sacred stone in Delphi, the Omphalos or world's navel. The most important theme is Evans's observation that 'The Baetylic stone was always at hand as a material home for the spiritual being, brought down into it by due ritual.'[11] He stressed how transitory was 'possession' of the stone. The otherwise inert object was only 'charged' (Evans's own choice of word) with the presence of the divinity through the innovations of the appropriate ceremony, and only when it was so charged did it become a true Beth-el (house of the Lord).

Evans also felt there was a connection between the presence and withdrawal of the charge of the divinity in the stones with the sap rising in the apparently inert wood, causing the trees (stocks) to flower and bear fruit: part of the natural mystery of the yearly cycle. The religious theme of trees and stones appeared side by side right through the classical period to the backgrounds of the Pompaeian wall paintings.

The second pre-industrial society we shall turn to is reported by Karl Isikowitz, whose studies took him to the Orissa region of India in 1952.[12]

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There he was fortunate enough to witness the Gotr ceremony of the Gadaba. The Gadaba live on the Koraput plateau and are responsible farmers and herdsmen, using a complex and multiple-year rotational crop system. Their villages are characterized by a central space in which stand 'rooted'* (and lie) the ancestral megaliths of the tribe. Isikowitz considered himself exceptionally fortunate as he happened on the ceremony during which these great stones were placed. It was unexpected, as he had been led to believe that the practice had died out, the only records being those of C. von Furer-Haimendorf.[13]

'If one is rich and does not hold a Gotr, the cattle will die and the harvest will be poor', Isikowitz was told. This was the Gadaba's way of explaining their intimate connection with the spirits of their ancestors and the motivation behind the whole act of erecting or 'rooting' their megaliths. Thus the Gotr ceremony is considered the greatest and most significant of all ceremonies for the Gadaba. A generation after the death of a particular descendant of the village founder, the central area in which stands a 'bo' tree (*Ficus religiosa*) and the arrangement of stones (sodor) are ceremonially prepared for the new chieftainship. Isikowitz tells us there are three important people in the village management and leadership: the chieftain himself assisted by a barrik (herald) and the dissari (shaman).

The ceremony Isikowitz witnessed on 10 January 1952 had been fixed precisely by astronomical calculations by a shaman from a neighbouring village. The whole ceremony was conducted within the rhythm of the moon's cycle and the high point of the feast was reached at the following full moon. He describes the performance of this special ceremony:

> 'Around two o'clock after the first day, they took two stones and placed them where the shaman had decided . . . one of the stones was laid flat on the ground and the other placed upright behind it. The shaman then placed an egg on the flat stone and mumbled something. Simultaneously with this act he decided when the actual final ceremonies would be held. At the same time two big poles or branches of a similli or red silk cotton tree (*salmalia malabarica*) were taken into the village and driven into the ground on each side and just behind the upright stone. This was followed by the beating of drums all through the night.'[14]

Isikowitz faithfully reports the details of behaviour, music, dance and ceremony, unfortunately too long for our purpose, but he did summarize the following:

> 'The Gotr ceremony is a kind of *rite de passage* . . . . These rites are a transition from one to another of life's phases . . . a kind of "social transformer" which mark the transition . . . from a magic or religious action to one of a productive technical character, or the reverse . . . a social transformation . . . of a number of different elements of which the physical change is one.' And he further observes 'the stones and the two poles . . . which were erected at the beginning of the ceremony are very important. Apparently, this is a kind of isolation of what is holy, just as one sets up an entrance or gateway to an altar.'

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* I am grateful to Dr. M. Yorke for the translation of the term for 'standing' stone as *rooted*.

And, in relation to the idea of the stones being inhabited, we could use Evans's term 'charged'. He says:

> 'The Gadaba say that by seating themselves on the sodor . . . the stones . . . the council members are in some way influenced by these ancestors so that their deliberations will benefit the people. The life power of their forefathers would thus supposedly be bound by these stones and influence those who came after.'[15]

Isikowitz tells us of the blessings that are conferred on the descendants of the ancestor who 'inhabits' the stones when they stand on them. He goes on to remark

> 'This is no unusual phenomenon; the Koya, the neighbouring tribe, erect a stone for a certain person before he leaves for the tea plantations in Assam . . . so that the traveller's life power will be bound to the village and can return home if he should die.'[16]

Before leaving this perceptive first-hand experience of a contemporary megalithic ceremony in India, two more very interesting points are made by analogy, each concerned with the energy transformations of this group of peoples. First, on the action of the stone's 'charge':

> 'The life power of the ancestors cannot be seen, but it influences the harvest and health and it appears again in the production rhythm and closes the circle exactly as in the grounding of an electrical circuit.'

Secondly, on the unbroken interdependency between the seen and unseen energies of the tribe:

> 'The life cycle absorbs the accumulation from the production cycle. The production cycle brings in a material result and gives out a religious result. This influences in its turn the goodwill of the powers, and this again has its effect on the production cycle.'[17]

Here the psychological and physical forces complement each other and are self-reinforcing, on condition that the correct rituals are observed.

This interdependency between physical and spiritual factors is explicit in the Hindu manuscript called the *Mānasāra Shilpa Shāstra*, an ancient manuscript which is concerned with the preparation of sacred ground for temple building and which will be used as part of the analyses of the British circles in the ensuing chapters. According to this authority, before the actual geometrical ceremony an annual cycle had to be completed to clear away evil spirits. A crop was planted in the chosen ground, oxen led over to graze and fertilize the site and, after the corn had sprouted, grown and ripened, the people prepared food which they then ate in order to close the ecological cycle ritually. Certain of the meal cakes produced from the harvest were sacrificed in the founding ceremony.

For the third and last example we move on to the so-called Easter Islanders, mentioned earlier, to investigate what might be known about their huge megalithic images which stare so enigmatically out to sea from the hillsides of their Pacific island.

Easter Island and Malta have been made into a 'splendid analogy'as 'both islands are remote ... and bear the enigmatic signs of activities on a gargantuan scale by a vanished population', which naturally directs us once again to the question of motivation.

Renfrew quotes Mrs Scoresby's evidence[18] of a burial at Easter Island which he believes, by comparison, 'may embody many of the features of megalithic burial at Orkney or Arran' (the Scottish islands).

A massive physical effort was obviously involved: not only erecting the huge images, but carving them first. To discover the motivation we must ask: what did the Easter Islanders themselves believe the statues' function to be? Metraux gives us evidence on this point: the massive megalithic images were 'vessels which the spirits entered when invited by priests', and some of them apparently *embodied* the spirits of certain ancestral figures who had become deities of the tribe,[19] obviously implying a function as vital to the community as the *sodor* of the Gadaba.

Each of our three examples clearly indicates that the body of the stone was as much a repository for a certain kind of 'life' as our human bodies 'carry' the mysterious span we call our own life.

It is too easy to put the ancient or traditional viewpoint into a 'naive' or 'superstitious' category but modern science is no nearer to being able to explain the meaning of our own lives, however much molecular biology demonstrates the wonderful intricacies of the mechanisms. It may be a form of naïveté on our behalf to dismiss a tradition as inconsequential when we may be ignorant of the values that gave rise to it. What seems evident is that the great megaliths would not have been achieved without this dimension of inhabitory spirits.

It is a particular 'modern' view that treats the metaphysical factors of human existence as hermetically sealed from the physical, and is part of the contemporary habit of compartmentalizing or atomizing human experience and activity. It is as 'unwise' as sealing off 'mind' from 'brain' or function from structure. For traditional societies based on the continuity of an integrative wisdom transmission, the metaphysical not only permeates the physical but is the 'cause' and 'maintainer' of the physical. A similarity by analogy would be a universal law of nature which a modern scientist would take as permeating and maintaining physical form—like, for example, the form of a hydrogen atom or the cohesive law of gravity.

For those hard-line rationalists who would like to do without the metaphysical altogether and reduce their world to the physical behaviour patterns of energy, it is salutary to look up this word energy in the dictionary. It merely means 'the ability to do work'. Reductionism can lead us as certainly to poverty as it can to essence. However our aim is to attempt an understanding of the megalithic builder in his own terms, that is, according to all reasonableness, in *traditional* terms.

Chapter 2 The Ground Rules

'We know that its centre is Your dwelling place. Upon this circle the generations will walk.'
Black Elk[1]

'But there is nothing either natural or necessary in the use of huge unwieldy blocks of stone where much smaller ones would have sufficed'.
T. Eric Peet[2]

'I have never valued or studied the mere sophistry of word-knowledge set down in books in conventionalized form of questions and answers to be committed to memory (and fired off at one's opponents); these lead but to mental confusion and not to such practice as bringeth actual realization of Truth. Of such word-knowledge I am ignorant; and if ever I did know it I have forgotten it long ago.'
Milarepa[3]

'By all the Greeks the honours due to the images of the gods were paid to unwrought stones.'
Pausanius on the early Greeks, ix. 38. 1[4]

2.1 The Giving of Grounds

The most comprehensive yet simple form for defining a sacred area is the circle. This 'opening to the transcendental' is achieved either as the result of setting out the parts of the temple as a whole or is literally symbolized by a physical feature such as a central pole or the smoke hole above the altar fire. The vertical pointer represents the ontological axis, which has its symbolic equivalent as much in the Buddhist pagoda and Tibetan chorten as in the spire of Salisbury Cathedral. (Despite being finished considerably later than the main body of the building, the central tower of Salisbury Cathedral is symbolically appropriate here as the two towers of the west end represent a duality, so the spire over the central crossing, the heart of Salisbury, stands for reconciliation and unity.)

Any human endeavour, on whatever scale, needs sufficient reason and motivation for its beginning. The larger and longer the project, the more will-power, intellectual conviction and sense of purpose is required for its completion. Nowhere is this more evident than when technical resources are minimal and manpower needs high, as was obviously the case with the

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placing of the lithic circles. As the psychological motivation invariably precedes the physical project it is to the former we need to look.

Kerenyi and Jung discovered the 'giving of grounds or reason for being' is one of the oldest and most basic of recorded myth structures, since it is fundamental to the fabric of each community's and individual's psychology.[5] The giving of grounds (sound siting) as the 'giving of substance to' is closely related to 'stance' and 'under-standing', foundations, as the basis of both psychological and physical security. Psychologically it is the rebuilding of the world, a rebuilding from and about that central point where one's origins or one's 'grounds for being', are. 'Origin', according to Kerenyi, has a derivation linking it to the Latin 'oriri', to rise, an awakening relating to the rising sun at the *origin* of each day.

If we turn to the traditional psychological viewpoint[*] on the theme of grounds for being, it is not the world (the physical environment) that gives grounds or a basis for constructing a cosmological image (the true framework of a temple) but the macrocosmic image itself, the archetype. This archetypal image is ultimately based on the same divine ground as the world and so it becomes the dwelling place of the gods and thereby regenerates the world. In other words, the archetypal pattern is prior to and contains the regenerative properties that are necessary for the sustained 'becoming' of the world. Mankind both affirms his own grounds for *being* by his capability of conceiving this archetypal pattern, and sustains his world by re-creating it in that world. [†]

S. H. Nasr, in discussing traditional theosophical doctrines of Islam, states that the underlying metaphysical principle is that knowledge and being are ultimately one and that through intellection the cosmos has gained its existence.[7]

The contemplation of the divine, therefore, takes on not only an important but vital role in the sustenance and preservation of the cosmos. To 'do this in remembrance' as Christ requested at the Last Supper, also reflects this role of *re*-membering or re-collecting, putting the members back together through the contemplation of the divine.

One manifestation of this principle of sanctifying or reconnecting with the transcendental is in the Vedic ritual for taking possession of a territory as cited by Mircea Eliade.

> 'One says that one is installed when one has built a fire altar (garhapatya) and all those who build the fire altar are legally established. By assembling the fire altar the presence of Agni and the transcendental world is established. This is re-enacting creation, in effect making a cosmos, reflected in detail by the number of bricks and their displacement, each standing for a cosmic period or pattern as formulated by the sages who devised the ritual.'[8]

In the light of these traditional patterns and the research of Jung, Kerenyi and Eliade it seems very likely that the stone circles have many of the characteristics of temples. All societies in recorded history, prior to the modern occurrence of pragmatic materialism, have lived within a transcendental framework; it is therefore unreasonable to consider the stone circle builders in any other context.

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[*] A traditional psychology is one, as defined by F. Schuon, which locates mankind's consciousness in a spectrum of consciousness, taking into account expressions more subtle and dense than those studied by other psychologies. It incorporates the most inclusive possibilities as well as limitations and accidents, and its aim is unitary consciousness, the fullest realization of potential. This latter has been given many names such as pure being, or enlightenment.

[†] The image as model is best understood by taking the proposal of Henri Corbin that we use the word imaginal for the realm of archetypal images.[6] This is a level of reality accessible intelligibly but not sensibly: in other words, interior 'visions' or the emergence of an archetype into the individual consciousness indicates that this imaginal realm is a psychological reality and is in no way dependent on the physical realm. In fact the traditional view is the reverse of the empirical, holding that the physical is dependent for its form and significance on the intelligible or archetypal world.

The word 'temple' has its roots in the Ancient Greek *temnos,* to cut off a sacred area, as well as in the Latin *templum* (space), which has survived in the modern 'template', and *tempus* (time). Thus the word implies a paradigm for both time and space and hence a sacred basis for these conditions of existence. The temple was a centre expressing the controlling archetype, a timeless source of time and a spaceless source of space, a centre of the world from which one could find the centre of oneself, the central reality of one's own being. Sacred space is an area set aside from worldly concerns for specifically religious reasons and for the con*templa*tion of existence and ultimate causes. It has an opening upward to the transcendent worlds and, according to Eliade, another below to the underworld and the world of the ancestors.

The opening to the transcendental can be taken both as a centrality and as a vertical axis. Eliade, and before him Guenon, have interpreted its presence in the core of the sacred space, seen variously as the world mountain (Meru), the Ziggurat, the universal column, Jacob's ladder, the maypole and the shaman's pole.[9] In the human body the opening for this axis has also been related to the fontanel in a newborn child. When the core is only a point or intersection at ground level it becomes an 'omphalos', or the symbolic navel of the world. For other symbolic expressions it will be made into a sacred hearth or an altar, and if the axis is located by a hole in the ceiling or apex of a dome it becomes the smoke hole or the 'eye of heaven'. The 'unmoving' Pole Star as a rotational axis of the heavens is also associated with the transcendental axis of the cosmos.

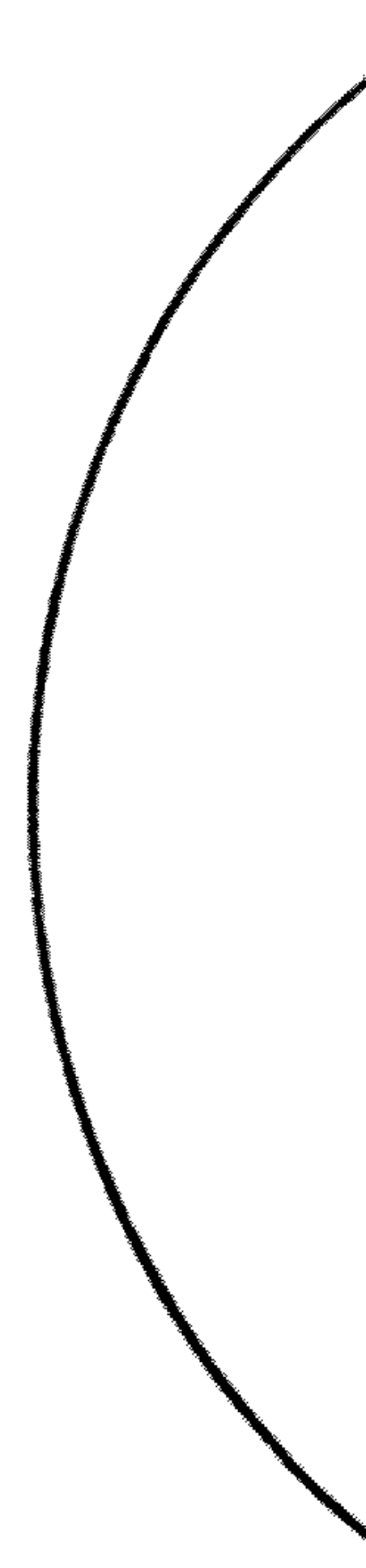
Although sacredness is One and representative of the principle of unity, to understand the traditional position of mankind in the establishment of sacredness we can look to the Far Eastern Triad which represents the separation of unity into three primary realms. Lao Tsu characterizes this process thus:

> 'Tao generates one. One generates two. Two generates three. Three generates all things.'[10]

Ho Shang Kung, the earliest recorded commentator on Lao Tsu, develops this as follows:

> 'Tao generates one: what Tao generates in the beginning is one. One generates two: it generates Yin and Yang. Two generates three: Yin and Yang generate the harmonious, the clear and the turbid, the three atmospheres which are divided into heaven, earth and man. Three generates all beings: heaven, earth and man together generate everything. Heaven expands, earth changes, man educates and nourishes.'[11]

This commentary is traditionally believed to be over two thousand years old. It is characteristic of the consistency of Chinese civilization that one



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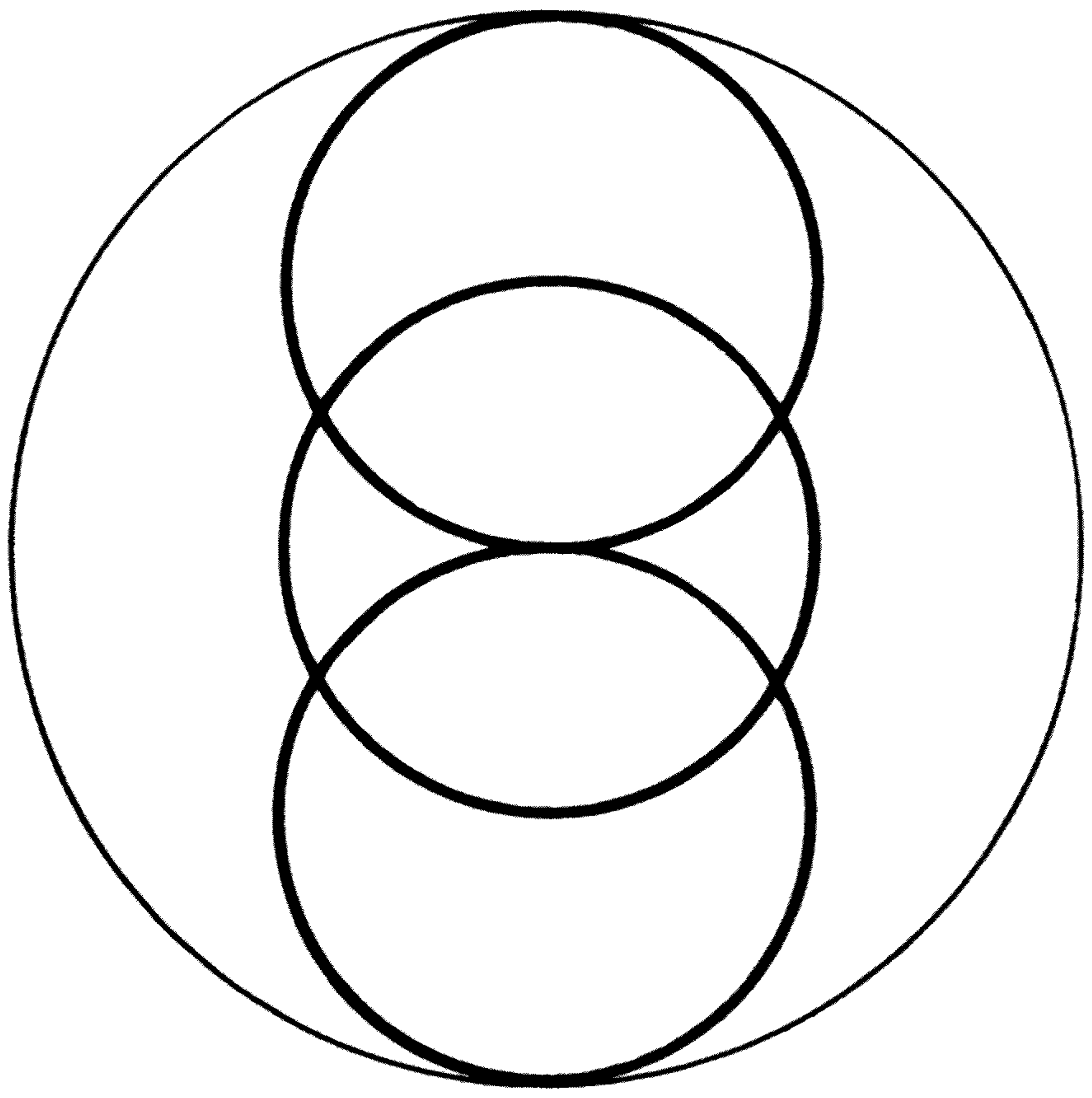
thousand years later Chu Hsi taught in his compiled wisdom:

> 'Therefore it is said that "Yin and Yang are established as the way of Heaven; the weak and the strong as the way of Earth; and humanity and righteousness as the way of man". It is also said that "If we investigate the cycle of things we shall understand the concepts of life and death".'[12]

As if to reinforce the essential nature of the centre of things Chu Hsi places the sage* at the centre of both his own being and the world:

> 'Therefore the sage abides by the mean, correctness, humanity and righteousness. His activity and tranquillity are pervasive but in his activity tranquillity is always fundamental. This is why he can occupy the central position and neither Heaven, Earth, Sun and Moon, the four seasons nor the spiritual beings oppose him.'[13]



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Three reflections of unity.

One method to visualize the interrelationship between the three primordial realms is by drawing a diagram. A geometrical diagram holds a special value as it partakes of the principles of symmetry and order on which creation is structured and therefore is both symbolic and descriptive simultaneously. It is in this intrinsic qualitative nature of geometry that the primordiality and primacy of the megalithic circles lie. This diagram can be visualized in two dimensions as three interlocking circles and in three dimensions as three interpenetrating spheres. Each circle, or sphere, represents the spheres of Heaven, Earth and Man. In this scheme the uppermost sphere is Heaven, the lowest is Earth and the central linking sphere is Mankind. These three primordial reflections of unity have been described variously as: the gods, the ancestors and society; or as the upper world, the underworld and 'our' world; or the upper as the sphere of ideas and pure being, the symbolic, next the lower, the diabolic, world where order is continually dissolved into less integrated states (an entropic world of increasing disorder) and centrally the balancing sphere of human consciousness. In the religions of many societies, and markedly in the shamanism of Siberia, there is a symmetry of divisions above and below the sphere of mankind, that is, there are as many heavens as underworlds.

One ancient Chinese tradition states that in the capital of the Perfect Sovereign the sundial must give no shadow at midday of the summer solstice. The heavenly archetype is described as existing at the centre of the universe near the miraculous tree 'standing wood' (Kien Mon), and here the three cosmic spheres, heaven, earth and hell, intersect. There is a parallel symbolism in the Vedic Indian tradition of the three gunas: Rajas, Sattva and Tamas. Sattva is light and corresponds to the enlightening power of heaven; Rajas is movement and corresponds to the horizontal axis in the human plane; while Tamas is inertia or darkness and can be related to the entropy of the underworld.

The triads of Barddas, a traditional oral teaching, outline in Christian terminology the way in which it is believed the Druids, the last priests and teachers to use the stone circles before the coming of Christianity, may have

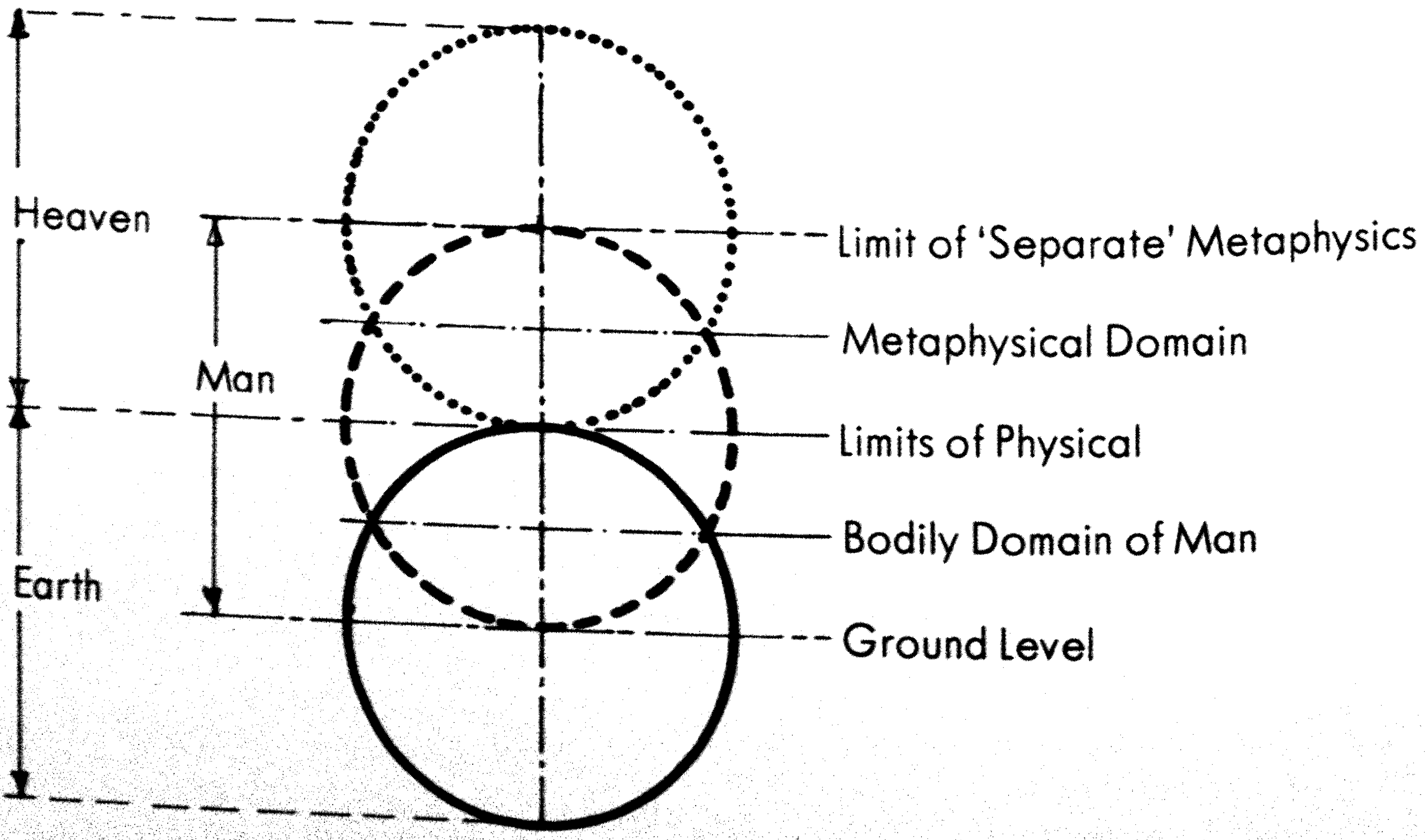
*
The word 'sage' is not to be confused with the modern usage. It refers to an individual who has reached psychological integration or enlightenment, the fulfilment of disciplined spiritual practices.

used the symbolism of the three archetypal spheres:

> There are three circles of existence: the Circle of Ceugant where there is nothing but the God, of living or dead, and none but God can traverse it; the Circle of Abred, where all things are by nature derived from death, and man traverses it; and the Circle of Gwynvyd, where all things spring from life, and man shall traverse it in heaven.
> The Circle of Abred in which are all corporeal and inanimate existences.
> The Circle of Gwynvyd in which are all animated and immortal beings.
> The Circle of Ceugant where there is only God, the perfect rim that bounds the immensity of existence.

There is also a semitic tradition reflecting the three primordial spheres which states that the Rock of Jerusalem is held in the mouth of the serpent Tahom, being the point of intersection of the underworld and the upper world. This point marks the opening to the watery chaos that precedes creation and symbolizes the reintegration into the physical formlessness that follows death.

If we take the three interpenetrating spheres and consider them as a vertical axis, we can place ground level at the base of the human sphere, where mankind touches the ground, a plane midway through the material, earthly sphere. This is the ground on which we stand and raise ourselves. The third sphere is the heavenly or archetypal sphere 'above' the human plane yet interpenetrating it. The primary demarcation of sacred space establishes the boundaries inside which the temple proper reflects the structure of the cosmos, a model of the 'untroubled circulations' of the heavenly bodies. This contrasts with the 'troubled' unpredictables of the domestic life of communities making their way in the natural world. These can be conceived as increasing in potential chaos as they extend from the hub of the community. The wilderness and realm of aliens is just as real for any human group whether it extends merely to the next village or to so-called outer space. It is the realm of increasing unpredictability, the indefinite not the infinite.



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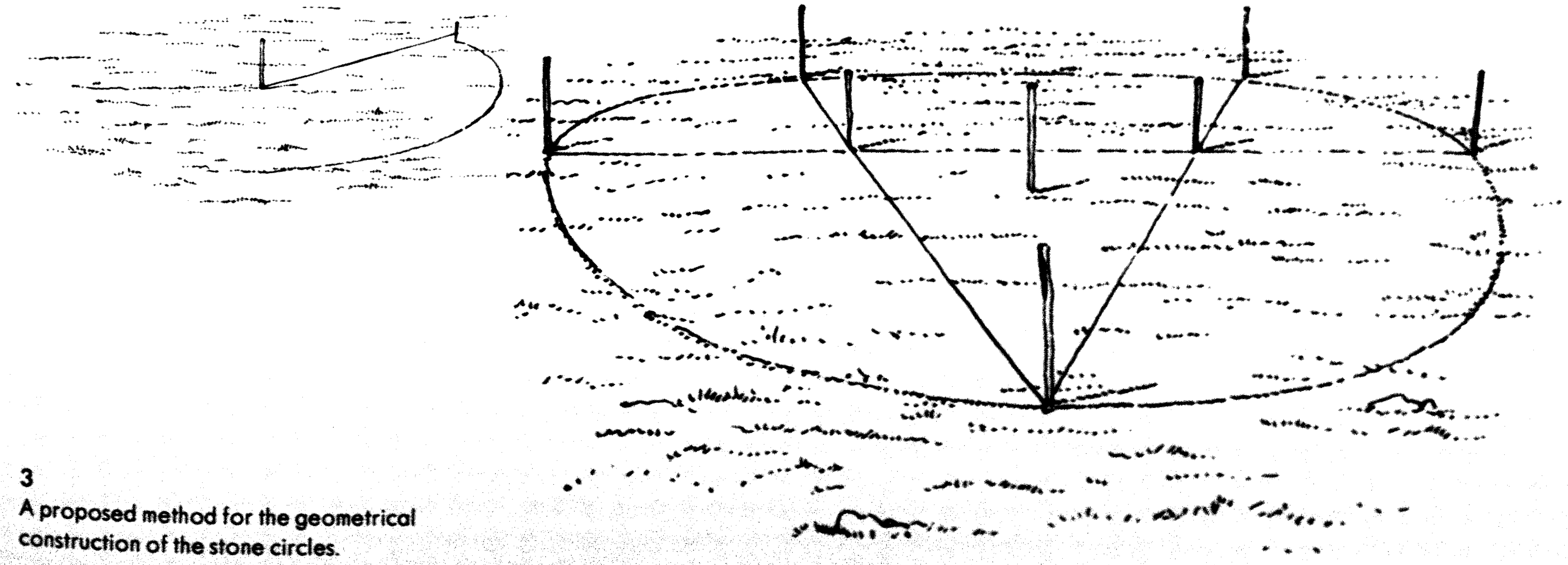
A village properly comes into being as another aspect of this conjunction between gods, ancestors and people. The central meeting place, or village green, is for ceremonials and is 'common ground', both in the sense of ownership and rights, and, at another level, as the common ground of being of that society, making it vital to the maintenance of correct relationships within the three spheres.

Having changed the axis of the symbolism we can see that the underworld and the lateral unknown territories outside our own region can be compared. The thresholds of habitation, seen as affording increasing sanctuary, conform to concentric circles, the centre being the most protected from surrounding chaos. So it may be possible to identify the stone circles as protected areas, both in the psychological sense of sanctuary and in the practical sense of the knowledge they embody as information necessary for the community to orientate itself to the rhythms of the solar system.

Plutarch's description of the foundation ceremony for the city of Rome is a good example of the way a rite as psychological grounding is related to the physical layout procedure for sacred geometry. In his biography of Romulus, Plutarch relates that a central pit called *mundus* was taken as the centre of a ploughed circle, and *mundus* was considered to be an actual or potential opening both to the underworld and the ancestral spirits. Another Roman author, Varro, confirms Plutarch's description when he says that the Roman *coloniae* on their foundation were called *urbes* from *orbis* meaning round and/or *urvo* meaning to plough round.

One parallel between this ceremony, apparently inherited from the Etruscans, and the laying out of a stone circle is in practical geometry. The circles are most likely to have been staked out with sharpened wooden poles and rope or cord of some kind. The large trammel (compass) that must have been used to obtain the curves for the ground rules would probably have had a sharpened stake at each end: one controlling the centre of the arc, the taut cord taking up the radius; the other, the scribing end, cutting or lightly ploughing the desired areas. The same method could have been used on a larger scale when founding the site of, say, Avebury.



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A proposed method for the geometrical construction of the stone circles.

Perception and the Ground Rules

As our perceptions are inevitably influenced by what 'experts' tell us, an unavoidable conditioning, if we wish to see freshly a special effort is required to keep our minds open to alternative frames of reference. When viewing examples of great architecture so much of our appreciation depends upon our cultural background and therefore our frame of mind. If we were shown one of the Japanese Buddhist temple gardens with their stones magnificently placed in sand, as Westerners, we would have been conditioned to respond aesthetically.* If, however, we were conducted around the Yantar Mantar at Jaipur, where the Moghul Maharaja Jai Singh II built a series of enormous astronomical instruments, similar in size to the sarsen circle at Stonehenge, we would be influenced to approach them as technological instruments.† Yet both of these examples contain symbolic values on the one hand and precise cosmological values on the other.

If we are to ascribe to the builders of the British stone circles an astronomical understanding of the sophistication that modern research implies, then we must be equally generous toward all of their sensibilities. We need to make a very real effort to banish any idea of crude and insensitive people when considering these megalithic builders. As one becomes aware of the Far Eastern masterly stone placings one finds a new level of understanding and appreciation through these sublime relationships.

In the British arrangements there is an amazing balance between the geometric order and asymmetry of the placings of the stones in size and closeness. There seems no doubt that here is a sensitivity to individual stones that we have tended to miss by paying too much attention to the rather more uniform Stonehenge. Due to the precision of the ground rules we have to take a new attitude to the form and placings of the stones.

It is a brave person who dismisses the professional surveying of Professor Thom, even if he cares to differ over his metrological and astronomical conclusions.[14] From an architectural standpoint we find the geometrical thesis of his important findings not only acceptable but a milestone in the appreciation of the subtleties of the Neolithic mind. The intelligence implied by these subtleties is the major concern of this book.

With the geometry behind the appearance established by statistical method, it now becomes important to appreciate the other deliberate effects that the circles embody. With very few exceptions the centres of the stones are not evenly placed around the 'circles'; this is an important factor as it would not only be more obvious but also much easier in terms of 'pacing out' to have made them so.

With no exceptions the stones differ in size and shape from each other. Notwithstanding the reluctance to work the stones this we must accept as a deliberate intention by the builders and not a contradiction to the idea of creating the geometrical order of the circle. To reinforce this viewpoint there are usually stones available within the working area that are nearer to a consistent size. Not only this, but should we seek to rearrange the existing stones in any circle in a more 'orderly' manner we would have plenty of room for manoeuvre. We are forced to recognize a paradox; here is the sophisticated accomplishment of symmetry—asymmetry or what we might call 'random-order' where precise placement and a recognition of the unique quality of each stone are in equilibrium.

In addition to the pure circle it is the almost circular structures, such as the ellipse with two centres and the egg shape with four centres, that seem to have held particular significance for the henge builders. This fact alone prompts us to examine the other shapes more closely as they are far more sophisticated and difficult to create geometrically than the primary circle.

Another important aspect in the choice and placing is the physical properties and quality of stones used. We can no longer ignore these physical properties for they might be an essential reason for the apparent randomness of placing and difference in size. As to the quality of the stones, there may be subtleties and conditions known to the builders of which we have yet to become aware. Those of us who have been brought up in an urban, industrialized society find sensitivity to stone difficult, even in differentiating it from concrete or composite stone. In much the same way we experience difficulty with many types of sensitivity; for instance a full sense of landscape—grass, bush, tree and animal life, no less than wind, plant aromas, firmness or softness of ground and all natural signs which indicate the quality of a day or place: to summarize, we have sacrificed our subtle sense of balance between the primary elements of our experience through urbanization. Our minds having been directed toward the overriding importance of wages, prices and incomes, are left no time to ponder the underlying reality of each man's relationship to natural resources, particularly the quality of the produce of the soil—our daily bread. Equally we have been diverted from the sense of permanence symbolized in the standing stones. Only a transcendent reality can satisfy the human intellect—even if it is temporarily diverted into believing in the absurdity of according relativity an absolute value.

The 'concrete' reality for traditional societies was metaphysical and grounded in the gods, whereas in our contemporary Western society it is literal and grounded in mechanisms. Hence our contemporary repetitive concrete 'boxes'—the tower blocks, flats and offices—proclaim an equality of identity to such a degree that they become mechanically identical and therefore anonymous, thereby denying the first law of the natural order of manifestation—variety and multiplicity in Unity, or uniqueness in unicity.

It would appear that there were simultaneously intellectual, artistic and technical inspirations behind the building of the stone circles. This implies the most interesting integration between day to day human affairs on the one hand and the idea of space and time 'in eternity' on the other to the community for whom they were built. The abstract concepts of calculation, the calendar, time and space all related to their immediate present. What could have been the one overriding motive power for this? If we turn to the great sagas and creation myths we find the recurrent theme of the gift of knowledge coming from the gods. We can expect therefore not only that the 'ground rules' emanate from the gods but that the prime purpose of the temple circle would have been to maintain this contact with the transcendental spheres.

The primordial fact of a standing stone is that it is no longer lying down – or 'dead'. It contradicts its material nature and is 'raised'. This change from a horizontal to a vertical position denotes a change in metaphysical being and points heavenward to the realm of the gods, one 'world' becoming another. The link between these worlds was clearly indicated by Plato when he suggested that it was in contemplation of the 'untroubled paths' of the planets that we should seek to solve our own troubled souls.[15]

We find in the great majority of pre-industrial communities the conviction that the positions of the heavenly bodies affect human affairs. This has the traditionally respectable title of astrology and yet 'contemporary' materialistic science has firmly placed it in the realm of a folk art and not the logical science that its name implies, astro-*logy* (star logic). However, the extensive and painstaking work of Professor Michel Gaugulin has found new respectability in the thesis of traditional astrology i.e. birth, time and planetary position linked to adult livelihood. If there is truth in the phenomena then we would expect the idea and establishment of such correlations to have originated out of acute observation in earlier periods – as would have been the connection between the weather, the seasons and the interrelated phases of the sun and moon over a year's cycle. When one pauses to consider, one soon realizes how reliant non-industrialized peoples are on the phases of the moon and the moods of the weather. No planned night expedition would be conceivable without taking into account the phase or light of the moon. Harvest moons are also matters of importance for gathering the winter's sustenance for many communities. Human sensitivities, survival strategies and the movements of the heavenly orbs having been traditionally linked, the logical outcome of these observations would be to establish techniques of anticipation. By these methods people might plan for the effects of the phases of sun, moon and planets. Some form of observatory would enable the community to be forewarned of both positive and negative values associated with these relationships between sun, moon, planets and the earth. How important these predictions may have been can be imagined in the case of the pile-village dwellers of estuary tidal waters at spring and neap tides.

A simple upright gnomon would be sufficient to make the measurement of the length of the midday shadow from which it would be possible to fix midsummer day. Another method would be to use the Pole Star as a permanent fix in the heavens.

How early observations and sightings were accomplished can only be a matter of speculation, but Professor Thom's precise surveys of Neolithic edifices have led him to propose adequately feasible techniques. His great inspiration was the accurate measurement of the stones as they stand, rather than digging for remnants and refuse around them in order to assemble a theory.

Though Professor Thom has raised the study of stone circles to a completely new level there is no substitute for visiting the sites oneself. The experiences to be gained are manifold and bring alive a synthesis between intelligent study and direct perception. The multidimensional nature of the whole setting is never less than awe-inspiring.

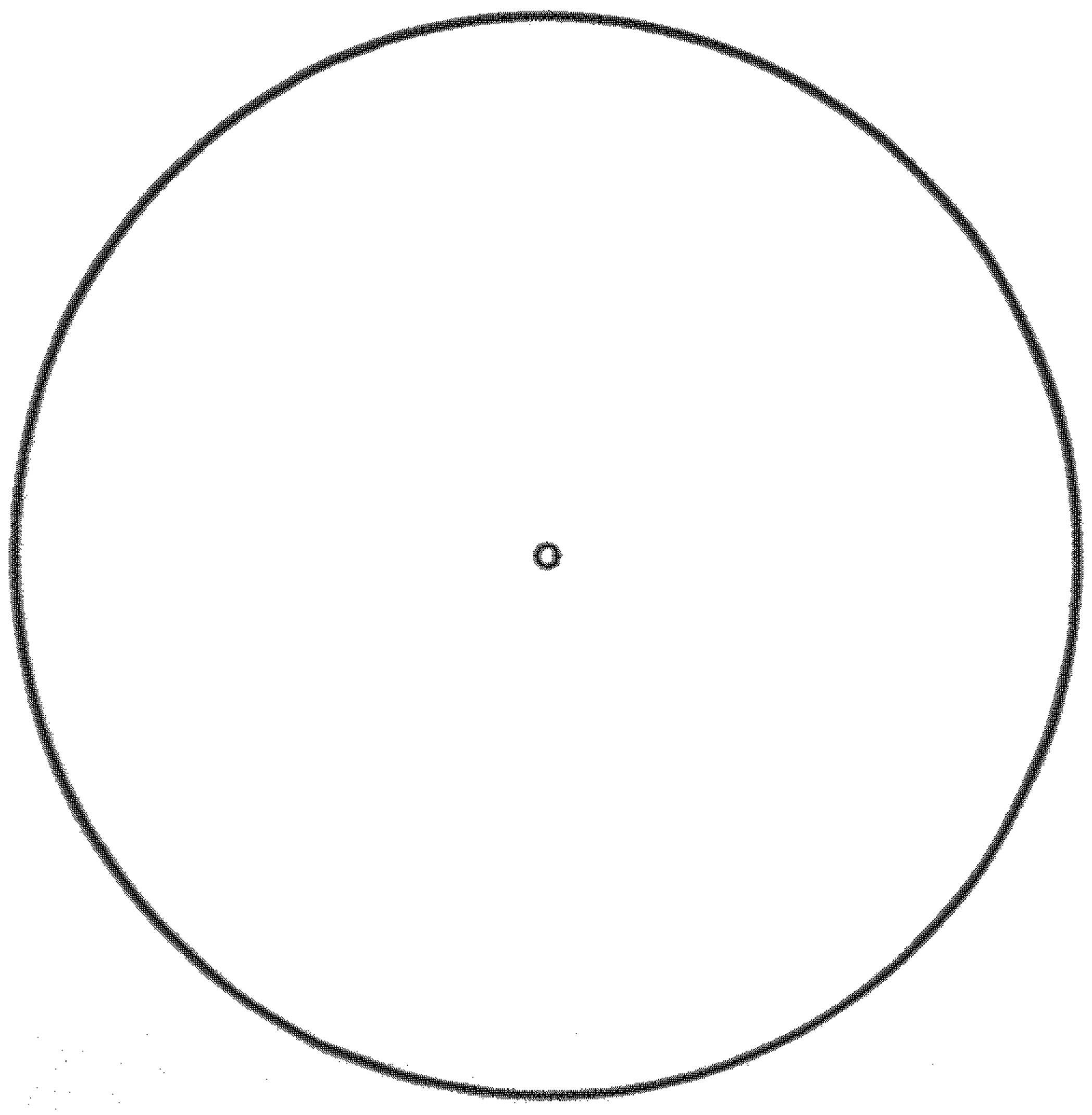
4
Borneo tril
the length

4
Borneo tribesmen using the gnomon to establish the length of the midday shadow, over the year.

2.3 Documentary Evidence for the Ground Rules

Our speculations as to how stone circles were laid out in a pre-documented period are based on evidence of the earliest written temple orientation procedures. These, to the best of our knowledge, are found in an ancient Hindu manuscript, the *Mānasāra Shilpa Shāstra*, and the details of technique bear most closely on our interpretation of the geometry used in British circles.

According to this document the initial act, establishing the ontological axis, is to erect an upright pillar, which tapers toward the top, in the ground at the centre of the chosen site. This recalls the world tree and echoes in Hindu symbolism the ṣushumna which is described as a 'ray joining every being to the spiritual sun'.



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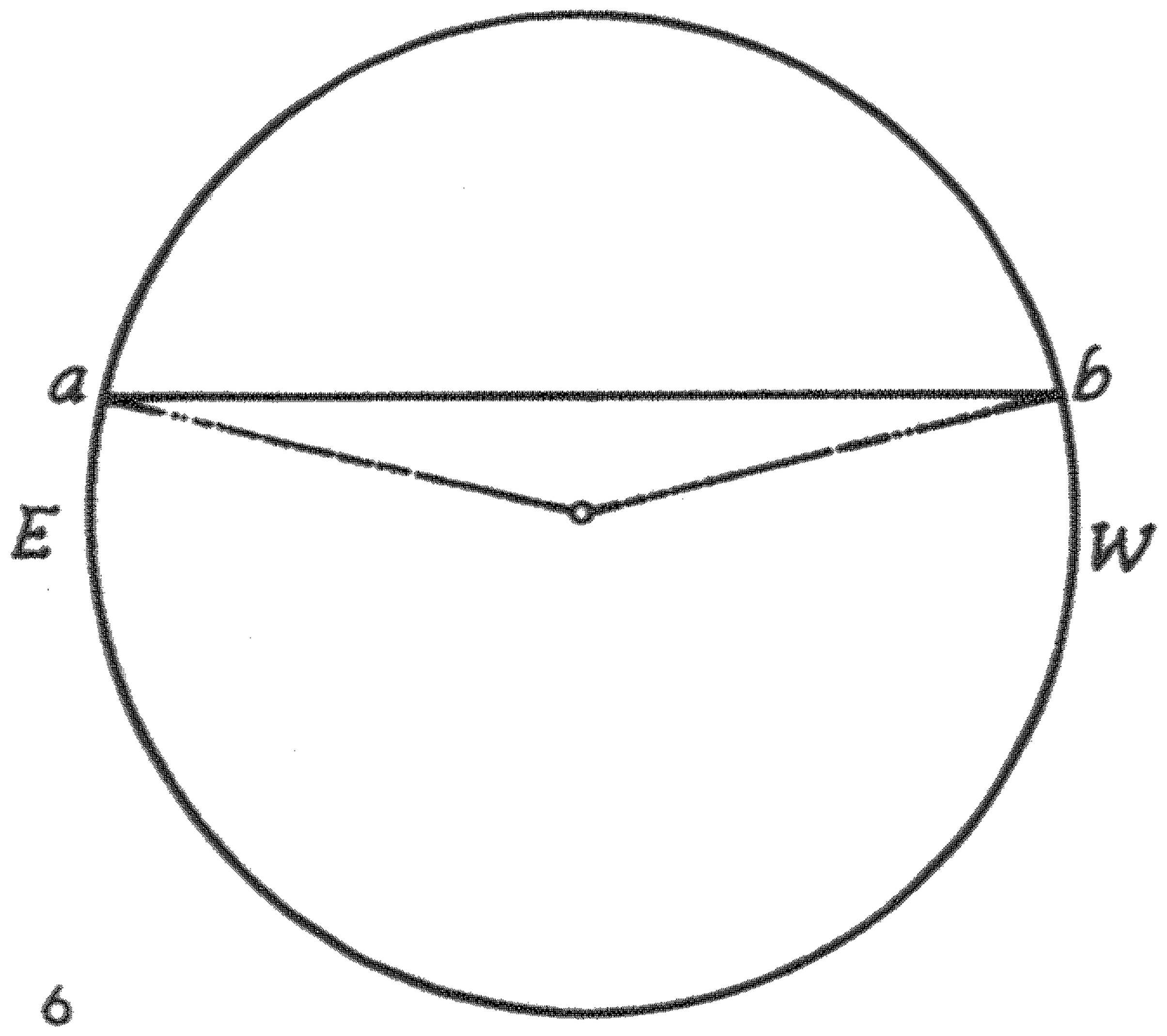
Next a circle is traced around the pillar with a radius twice the height of the column using the pillar as the central stake of a rope trammel (compass), which effects the enclosing of a 'cosmos' within from the relative chaos without. At sunrise the shadow of this gnomon-pillar is longer than the radius of the circle. During the morning the shadow of the tip of the column strikes the outline of the circle and the point of intersection is marked. The shadow lengthens during the afternoon and the second point is marked when the shadow of the tip cuts the circle again. These marks made in the morning and evening are joined to give an accurate east-west axis. This is the first cosmic axis on the horizontal plane: that of the daily path of the sun, thereby aligning the site to the solar system, pointing to the origin and termination of the day. To establish this east-west axis on the centre line of the circle a small circle is set out from the pillar to tangent the cord stretched between **a** and **b**. This small circle is stuck at **a** and **b** and a new cord tangent between them stretched – this is a true east-west axis from the major circle's centre.



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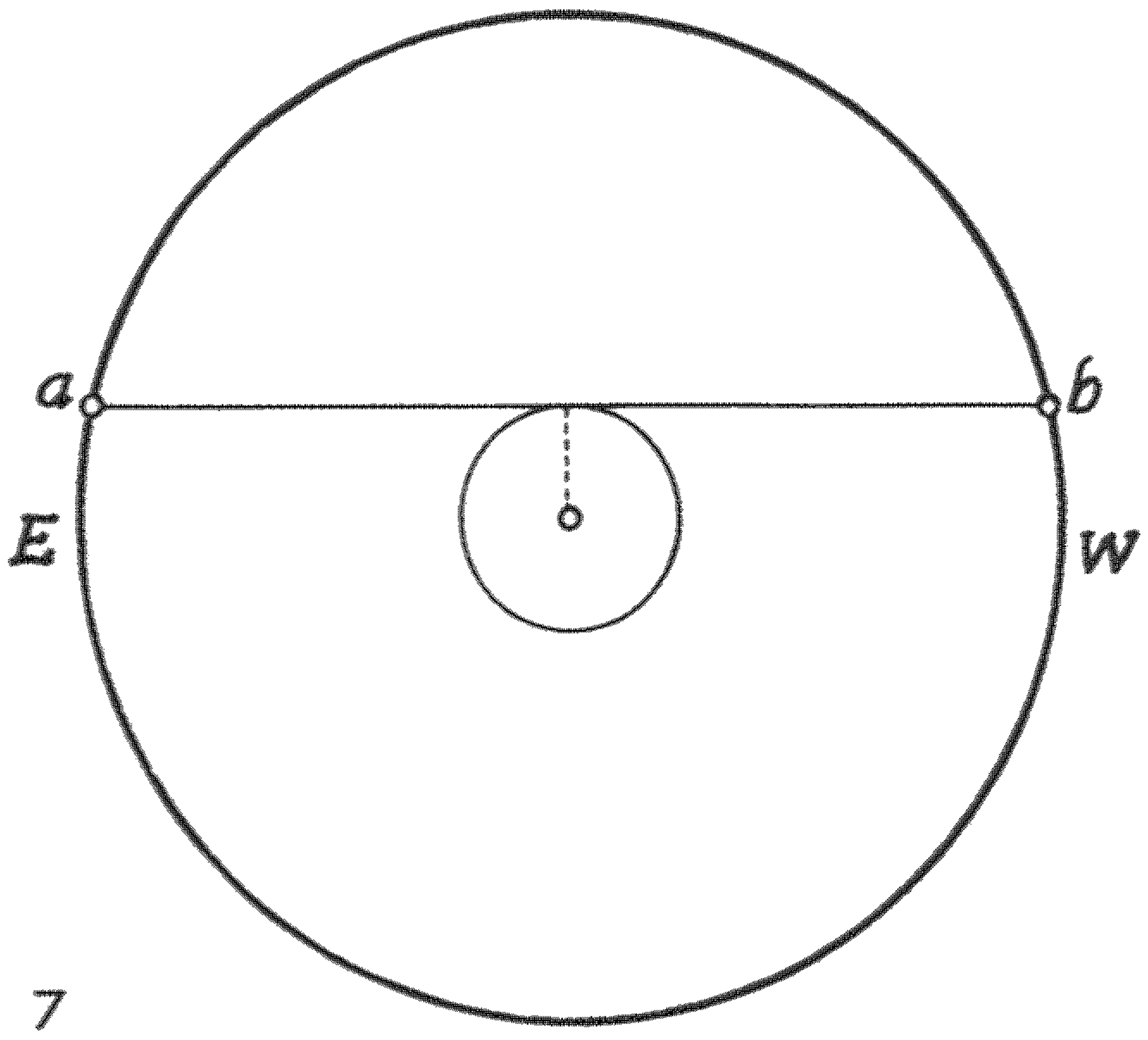

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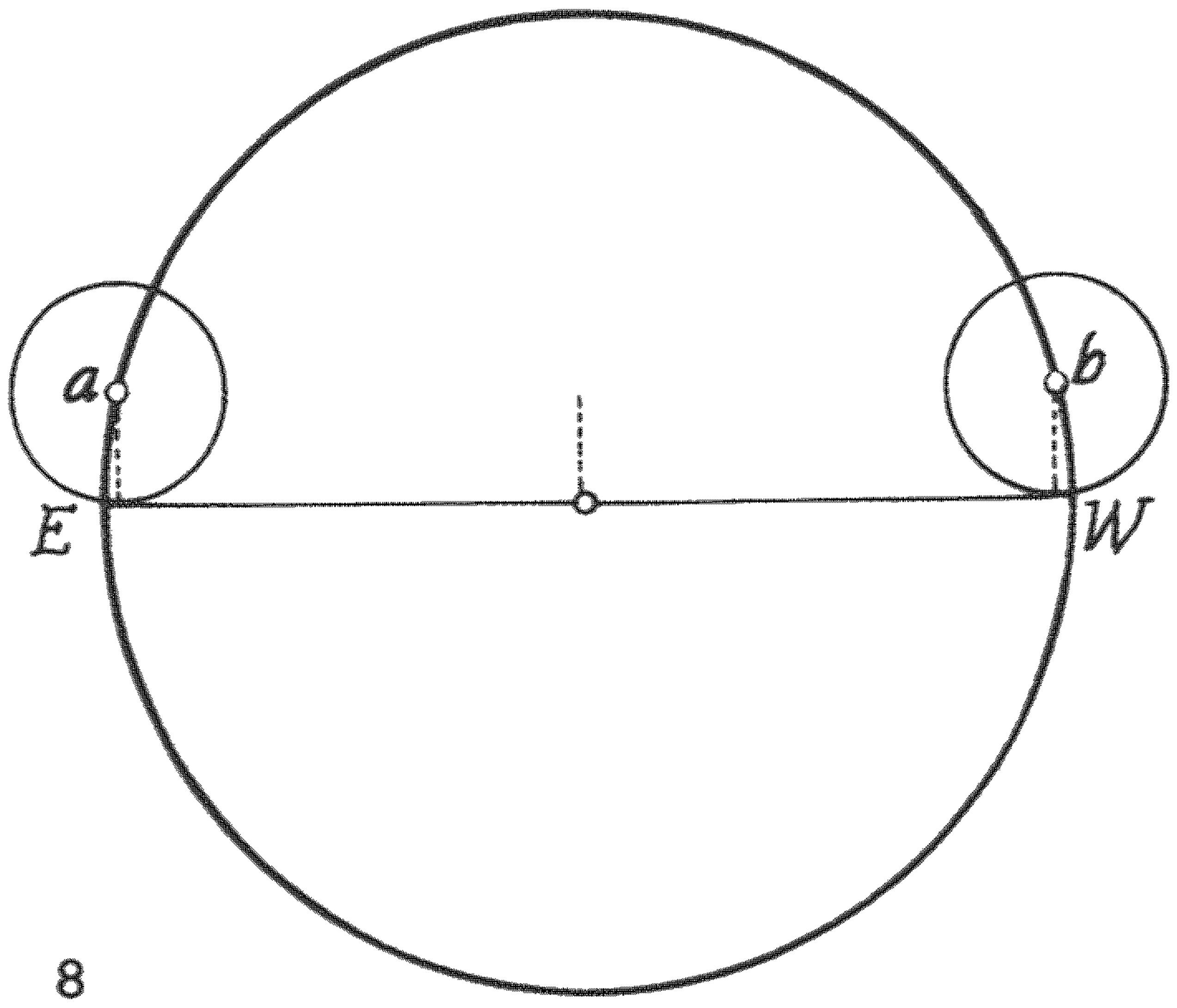


8

5–11
Hindu temple-founding geometry according to the *Mānasāra Shilpa Shāstra*.

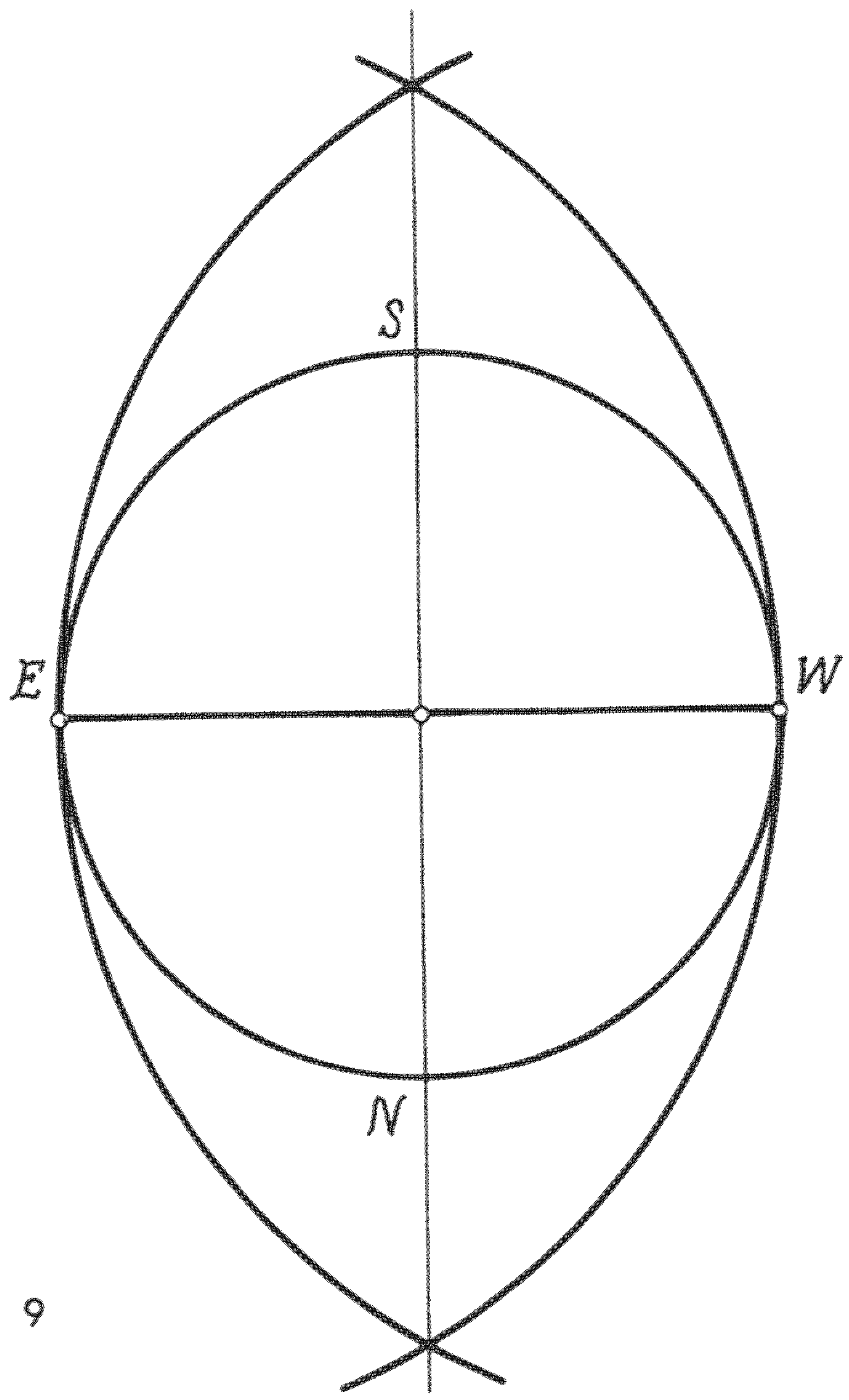
5
The first circle or sacred area with central pillar.

6
The dawn and dusk shadow lines establish the east-west axis.

7/8
The establishment of the east-west axis as a diameter of the circle.

Using a rope trammel the western point is staked as centre and a radius taken across to the eastern point. An arc is then cut which is not less than one-sixth of a full circle on either side of the eastern point. The same procedure is then followed from the eastern point as centre and the second arc made to cut the first above and below the east-west line. The 'fish' form produced by these two arcs is known as the *vesica pisces* in the Christian tradition as it is also a verson of the yoni, the feminine principle in Hindu symbolism. In this sense with due ritual the site is 'opened' and the connection with the transcendental is made possible.

When arcs are produced from the points N and S in turn a second fish-form results. When the four intersections made by the fish-forms themselves are joined, the circle is divided into eight equal segments. The axial division of this circle into four equal parts, the 'quadrature', relates to both the solar cycle, solstices and equinoxes, and the four obviously recognizable phases of each lunar cycle and has also been called the squaring of the circle of heaven*. The elaboration of the plans of Hindu temples from this basic 'squaring' is a ritual expressive of Creation from its source, multiplicity reflecting Unity.



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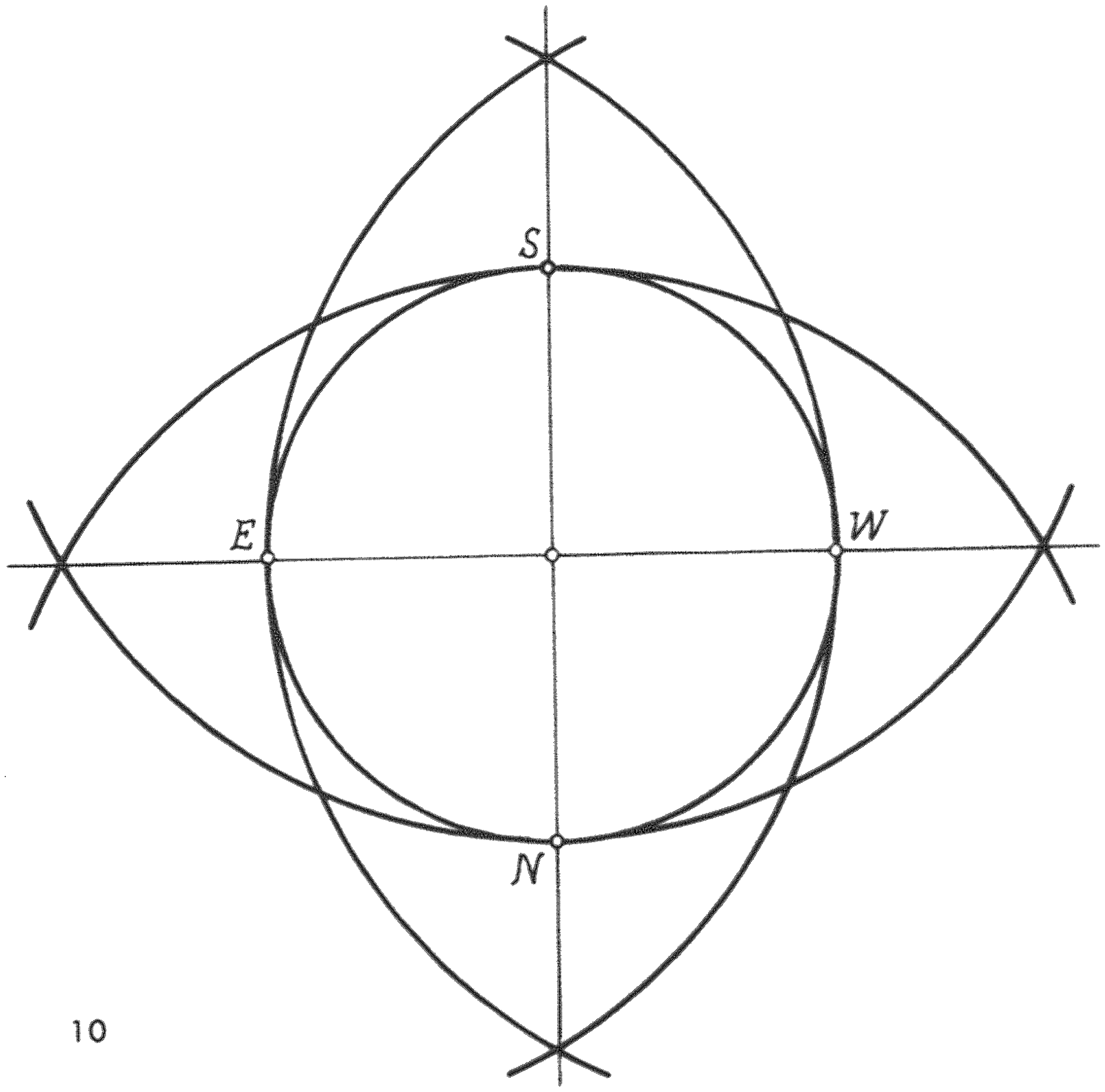

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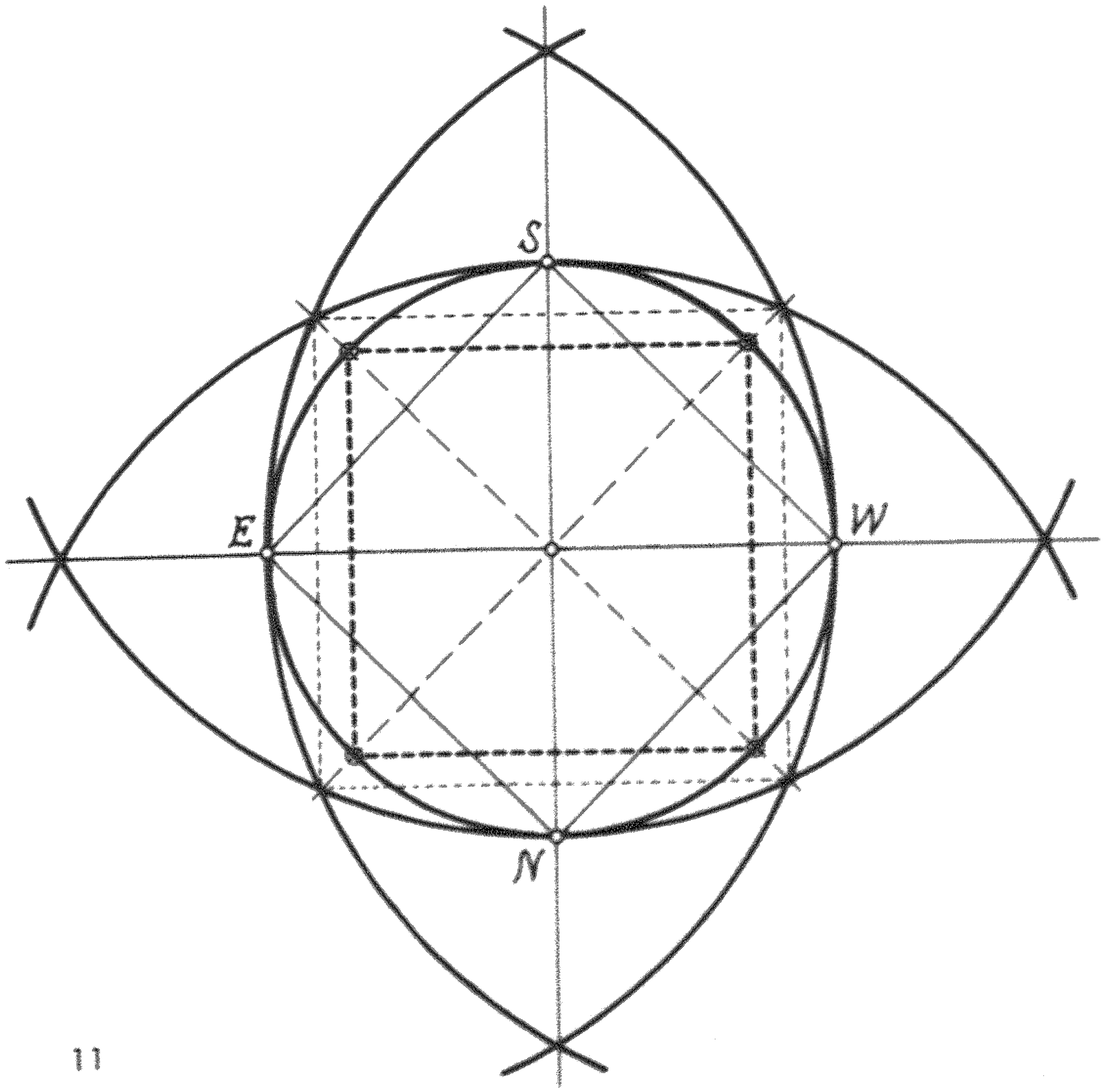


11

9
The vesica drawn from the east and west points generates the north-south axis. Hence the establishment of the cosmic fourfold pattern.

10
The establishment of the solar and lunar quadrature.

11
The 'squaring' of the circle of heaven.

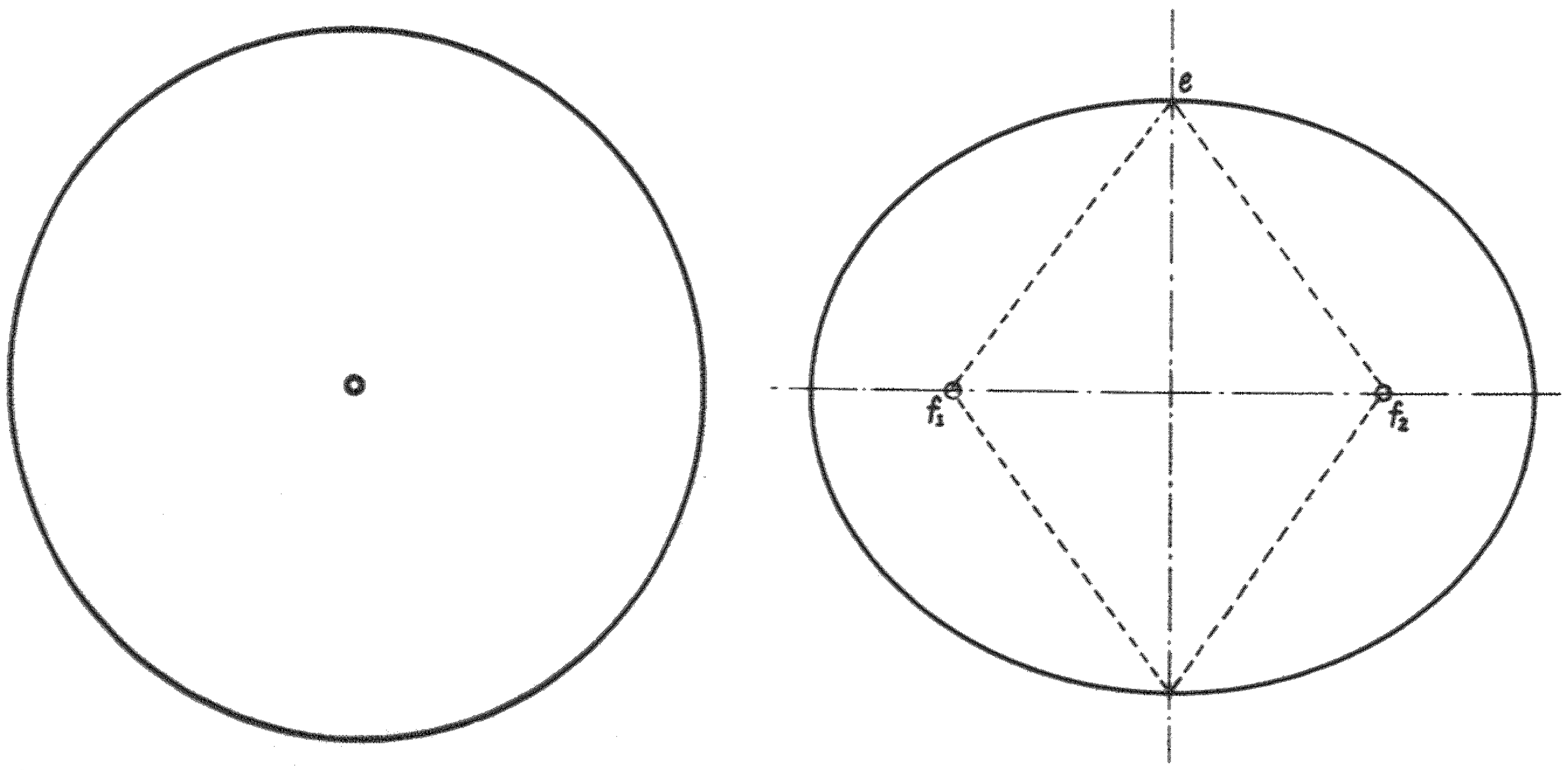
*

By tradition the principle of duality or complementarity is considered to be expressed in the macrocosm by the primordial divergence of the axes of rotation of the Sun and Earth creating longest and shortest days in the year. This difference establishes in human experience the quadrature of the year. In other words, because of the differences in rotational axis we get a shortening of days in winter, a lengthening in summer, and the exact equation of nights and days in the spring and autumn.

Titus Burkhardt, in commenting on the cosmology of Ibn Arabi, says: 'If the two great circles, that of the celestial equator and that of the solar cycle coincided, there would be no manifestation of the seasons. The divergence of the two great celestial cycles evidently expresses therefore the rupture of the equilibrium which engenders a certain order of manifestation, that is to say that of contrasts and of complementaries.'[16]

This procedure is a rite in the full meaning of the word, linking the form of the sanctuary as a microcosm to the solar system as the macrocosm. Orientation gives direction and is the vital factor in ensuring the effectiveness of a holy place. A clockface on which we measure the recurrent twelve-hour cycle orients us temporally in the day by remaining static relative to the hands which circulate as pointers. In a similar way the static primary circle of a temple is an unmoving presence (an eternity) against which we can measure our worldly eccentricity as we traverse the years and the circuits of our lives. As we shall see later, in the North American Indian tradition the 'circle of the year' represents the 'world', an instantaneous image of the passing of time over the basic cosmic cycle: one complete planetary journey around the sun.

Having cited two recorded traditions which involve sacred geometry we can test these principles on British stone circles. Before doing so, however, we must draw attention to the significant geometric fact that emerged from Professor Thom's surveys of many sites: more than one in three of the enclosures he has surveyed is geometrically more complex than the circle and many have a double centre. From his surveys Professor Thom discovered four basic types of layout* based on the circle, the ellipse, two types of 'flattened' circle (designated type A and type B by Professor Thom) and egg shapes developed from right-angled triangles.



12
The stone circle geometries as proposed and demonstrated by Professor Thom.

12a
The circle.

12b
The ellipse. This can be 'drawn' with a rope length equal to $\mathbf{f_1ef_2}$. With a rope tied to fixed stakes $\mathbf{f_1}$ and $\mathbf{f_2}$ looped round a stake at **e** the stake at **e** when moved round keeping the rope $\mathbf{f_1ef_2}$ always tight scribes an ellipse on the ground. Professor Thom points out that not until Menaechmus, mid-fourth century BC, do we have documentation of the ellipse. Whereas in Britain it is certain that our forefathers were laying them out in the 2nd millennium before Christ!

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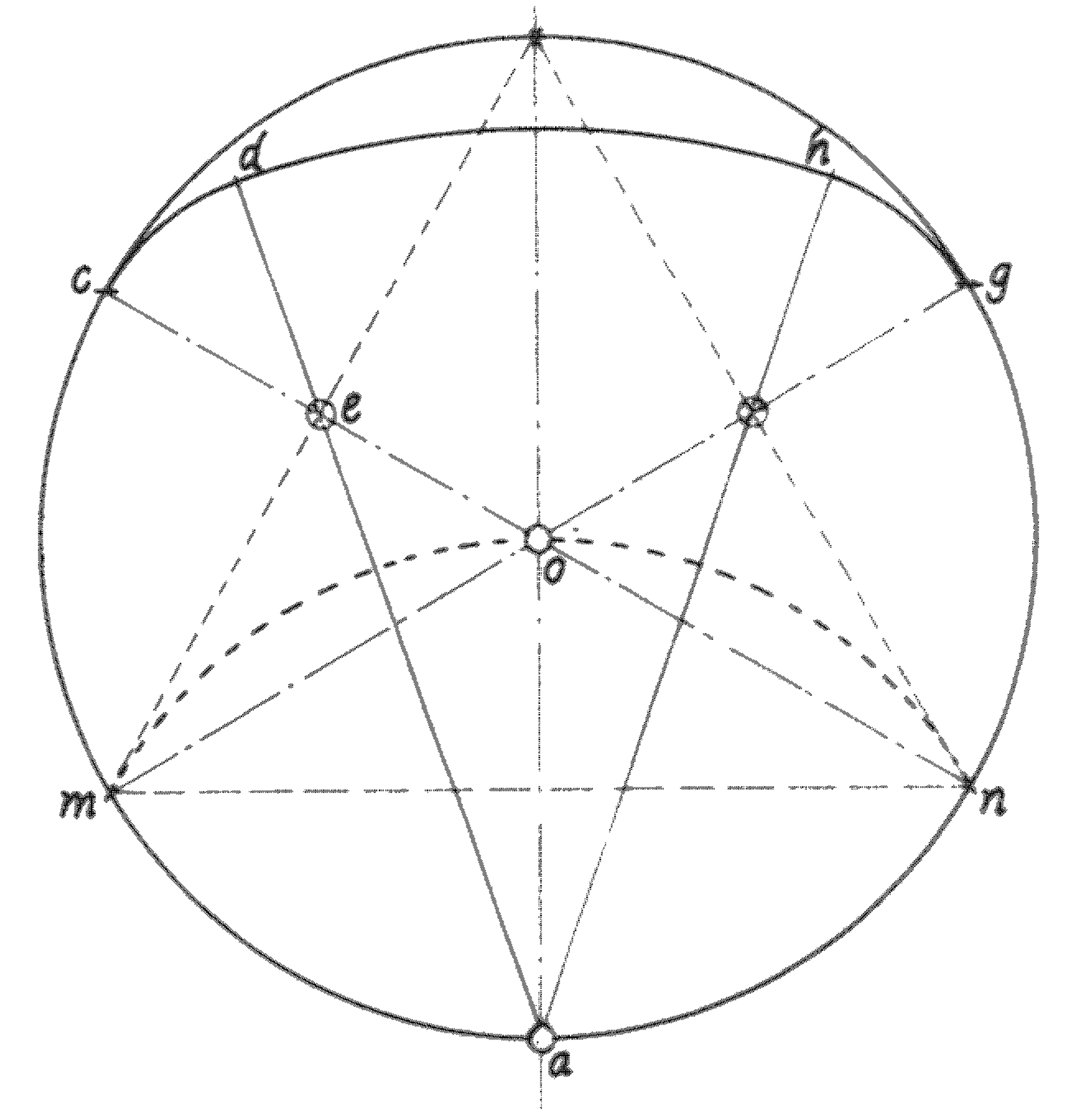
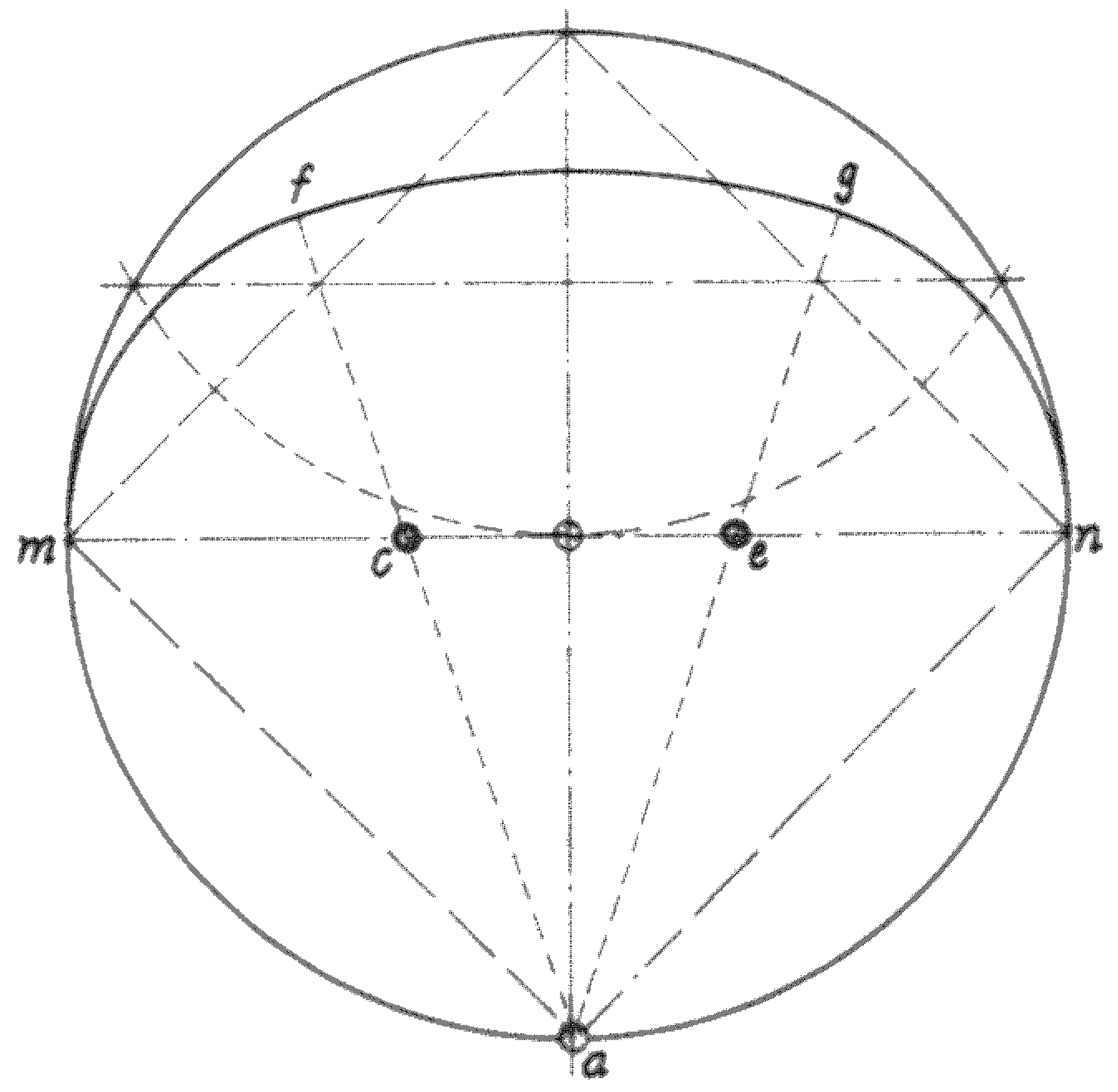
* In his most recent publication a fifth type has been added which is an egg-shaped circle with a semi-elliptical end, designated type III of the egg-shapes. See A. and A.S Thom, *Megalithic Remains in Britain and Brittany* (Oxford, 1978) p. 18.



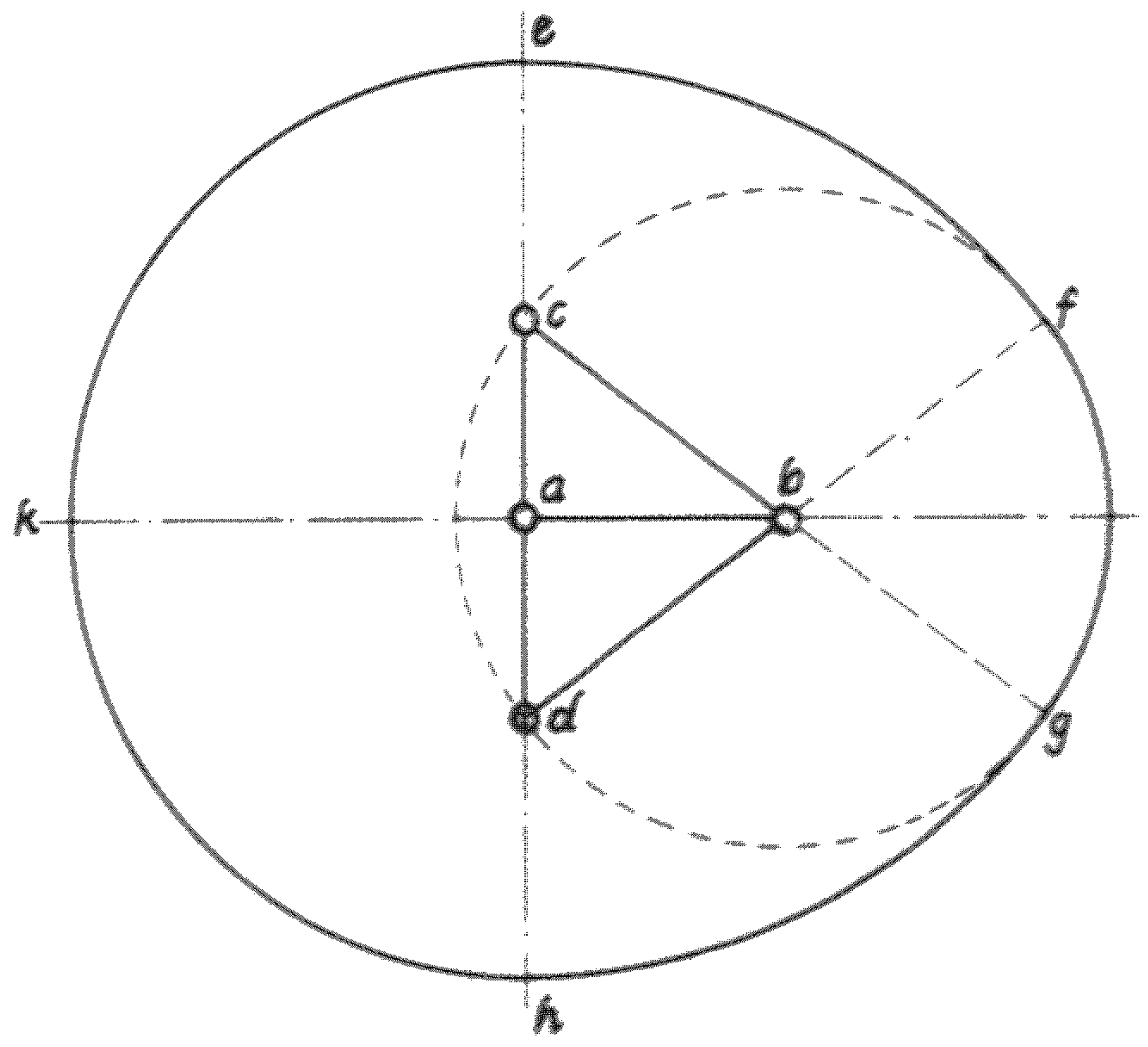
12c

Type A 'flattened' circle. To set this out one starts with a circular arc of 240° from centre **o** starting at **c** through **man** to **g**. The 120° angle **coa** is easily set up by making the two equilateral triangles **com** and **moa**. Next bisect **oc** at **e**. Then **e** is the centre of the arc **cd** (also by symmetry we can construct the arc **hg**). The remaining flattened arc **dh** is centred on **a** at the bottom.



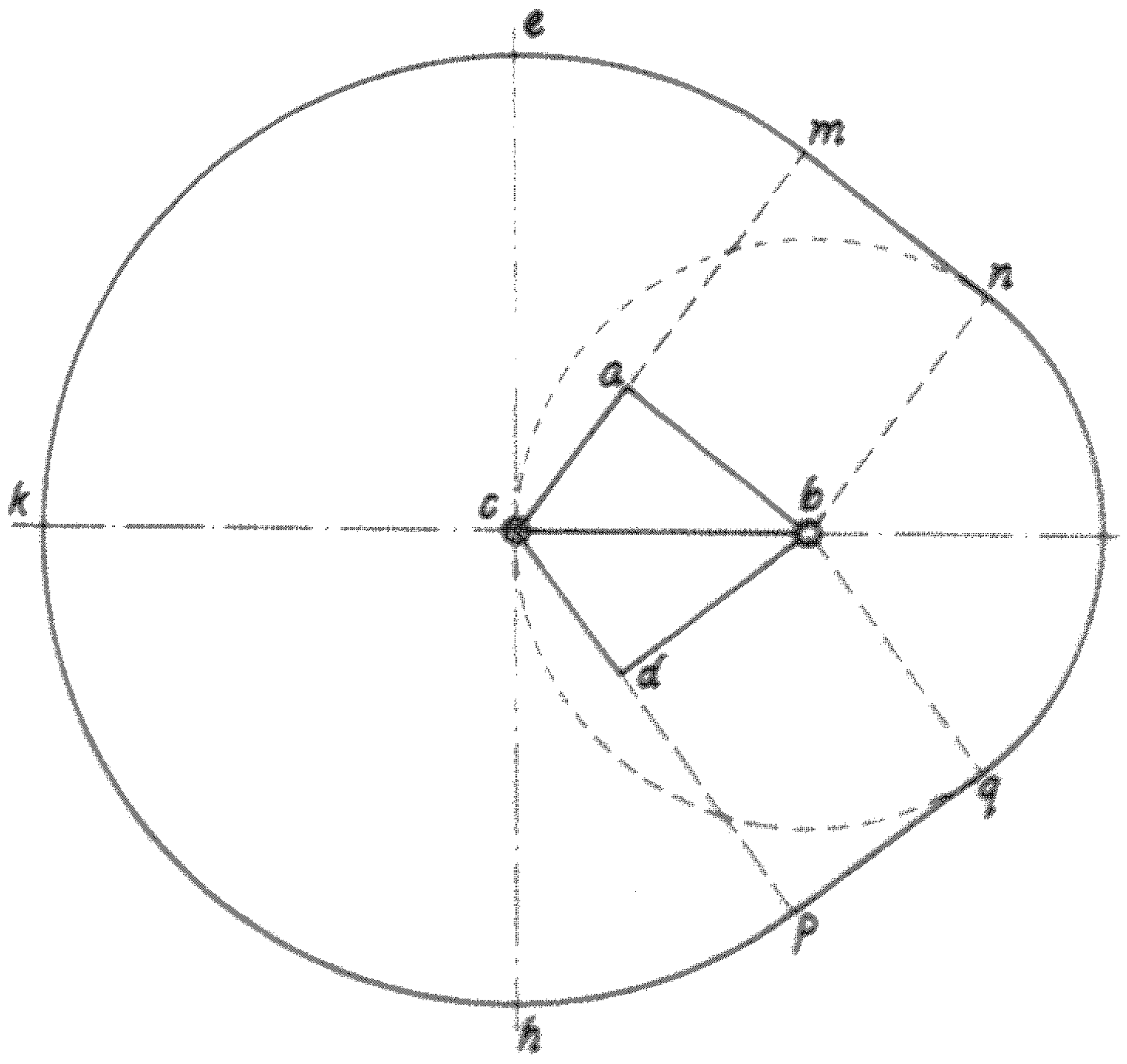
12d

Type B 'flattened' circle. To construct this ring is easier: first divide the diameter **mn** into three equal parts at **c** and **e**. These are then the centres for the smaller arcs **mf** and **gn**. As with type A the closing arc **fg** is struck with centre **a**.



12e

Type I egg-shaped ring. This is based on constructing two right-angled triangles placed base to base. (**abc** and **adb** along base **ab**). A semi-circle **ekh** is drawn with centre **a**. Next **d** is taken as centre and the arc **ef** drawn and with centre **c** the similar arc **gh** is drawn. The 'sharper' end of the egg is drawn from **f** to **g** with centre **b**.



12f

Type II egg-shaped ring. This type has two straight lines joining its two arcs and therefore is not a continuous curved boundary. The right-angled triangles mirroring each other: **acb** and **cbd** are joined along the hypotenuse. A semi-circle **ekh** is drawn as before and then each end of the hypotenuse of the right-angled triangle is the centre of the larger and smaller arcs respectively: with centre **c** arcs **em** and **hp** are drawn and with centre **b** arc **nq**. The arcs are joined by straight lines **mn** and **pq** which are drawn parallel to the sides of the triangle **ab** and **cd** respectively.

er Professor Thom.

star or terrestrial object
on in the horizontal plane in
ook to see the star or object.
d in degrees clockwise from
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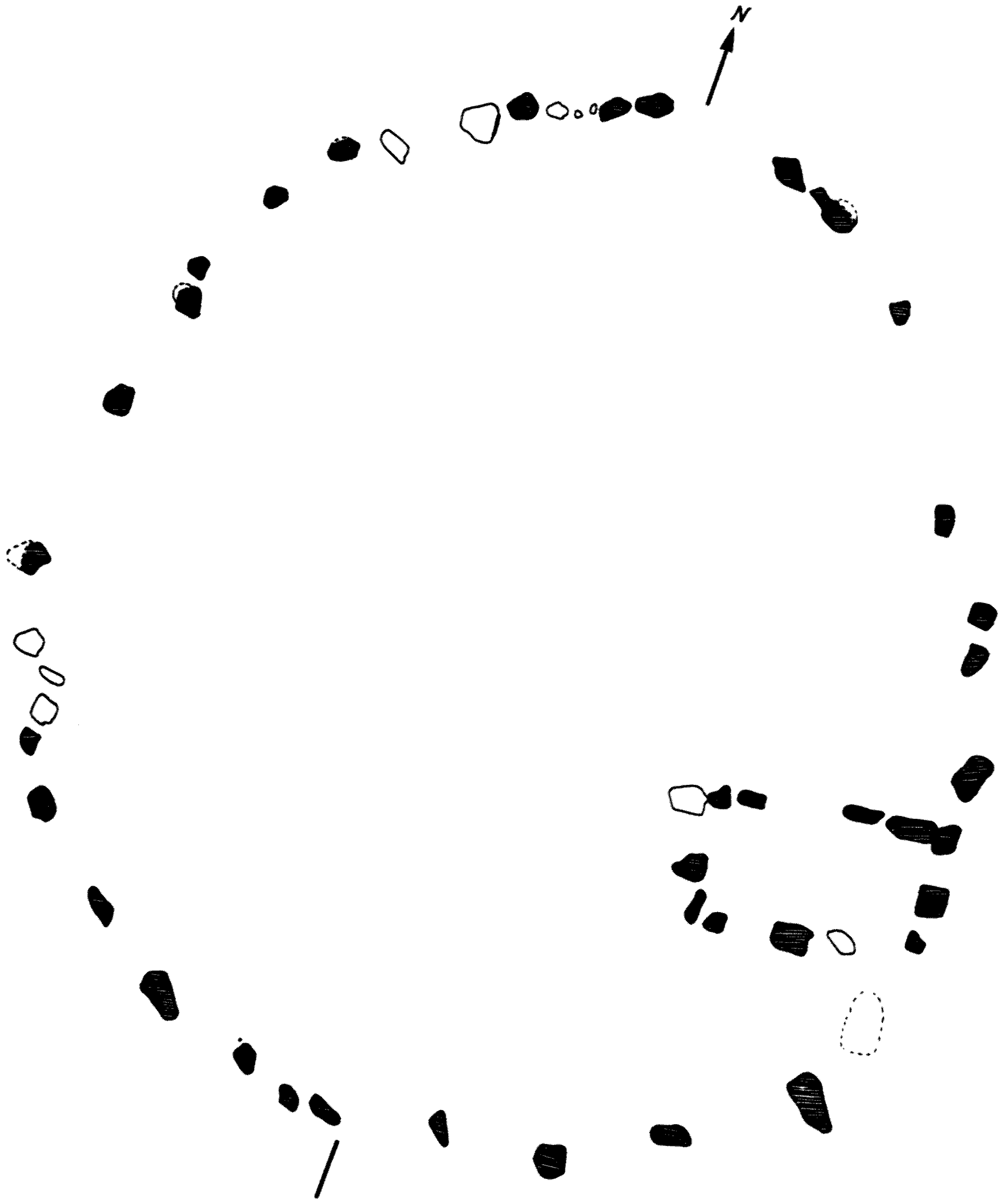
year.



The first circle we have chosen to examine is the beautifully sited Castle Rigg near Keswick in Cumberland. Professor Thom's accurate survey will be used as a starting point and, in the light of the remarkable number of coincidences between the geometry of the circle's layout and the astronomical requirements of a temple just described, Thom's proposals will be examined.

By using a statistical method Thom obtained (from his Castle Rigg survey) the curves of the flattened circle type A. When he examined in detail the positions of the stones they gave him seven solar and lunar readings; i.e. major extremities in the cycles of the risings and settings of both sun and moon. Four of the azimuths giving these declinations are defined by the geometry of the type A system.* Thom placed this proposed construction on the survey of the circle and found the axis of symmetry of the flattened circle (the line **bc** in Fig. 14) lay at an azimuth of 67° east of due north which he believes to be within a few fractions of a degree of the original orientation at the time of construction. He has remarked on the feat in siting that this represents, comparing it with the difficulty a whole team of modern engineers would have and the time they would need to find a site with the right kind of horizon for viewing the rising and setting of the 'heavenly lights', besides finding a conveniently flat part of a field on which to place the construction in relation to its horizon.

14
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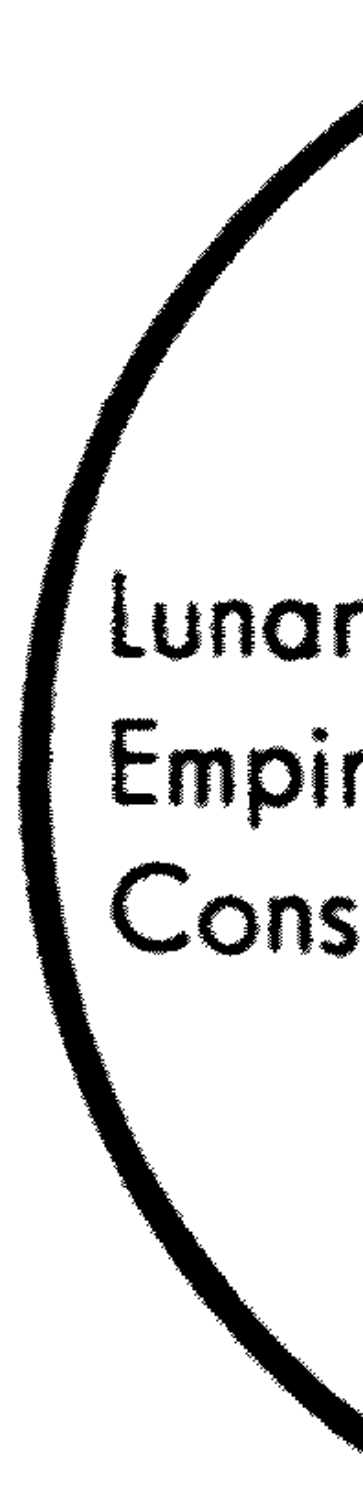
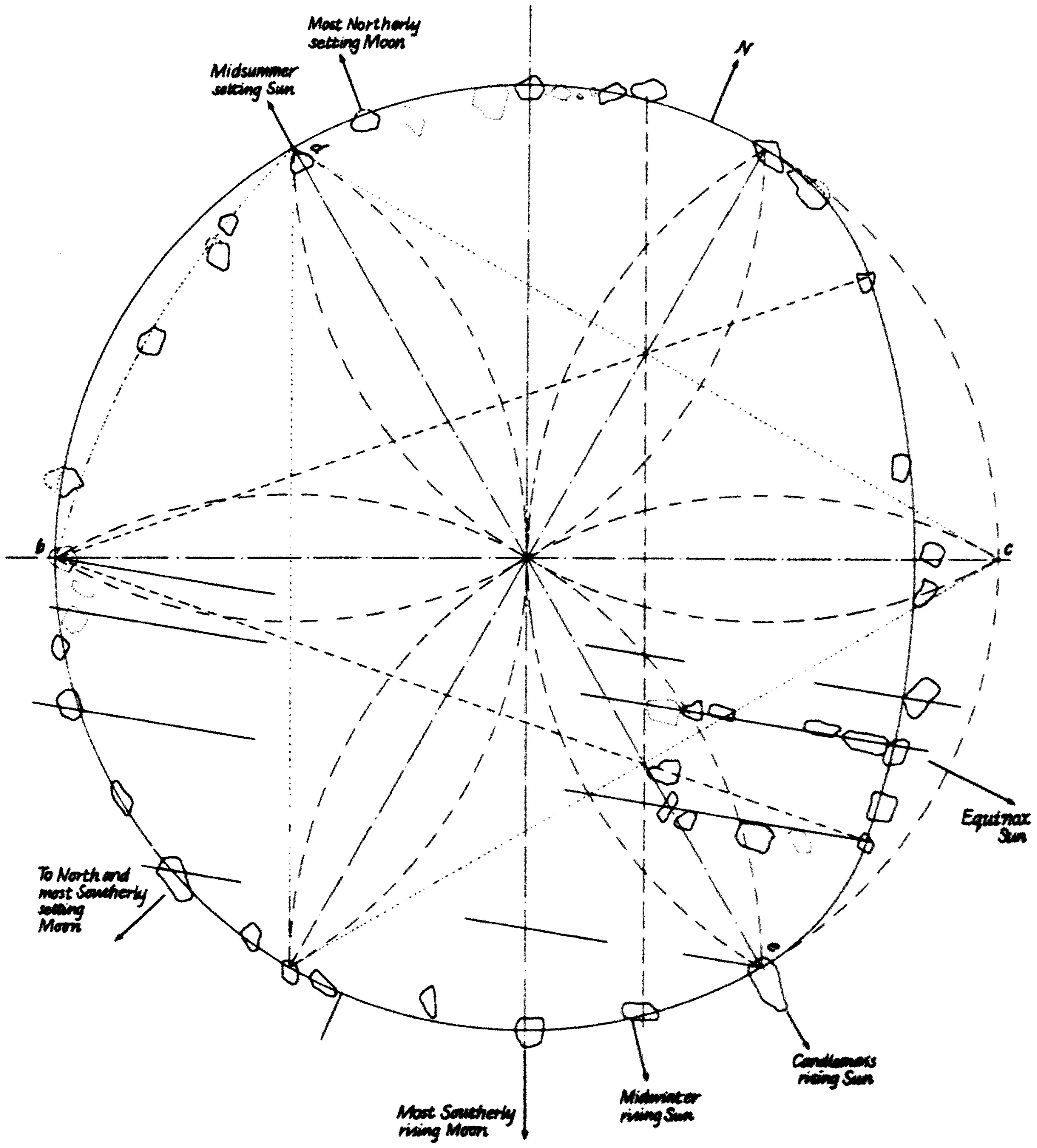
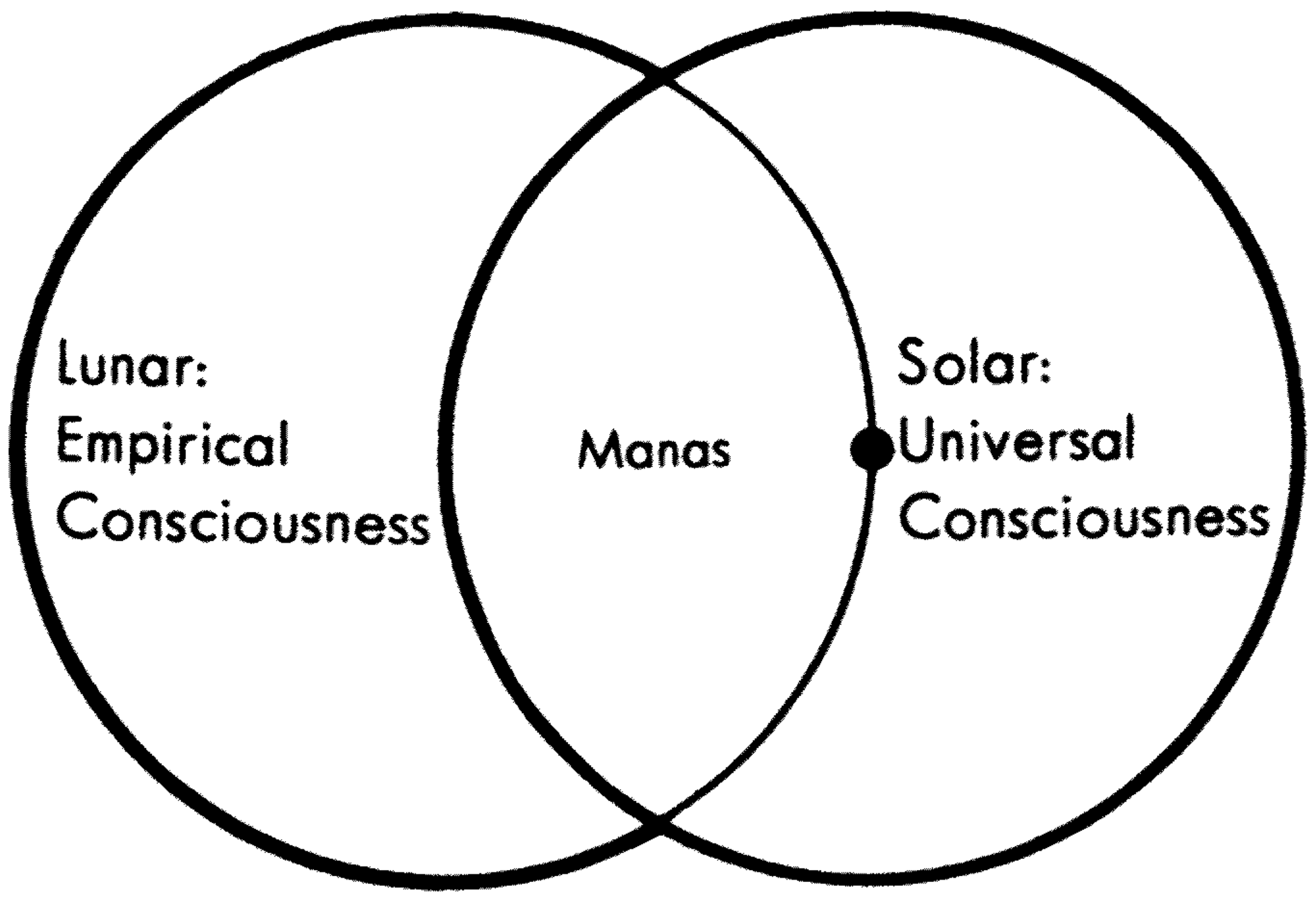


15
Solar

14
Geometrical analysis of Castle Rigg based on Professor Thom's type A system.


Most Northerly setting Moon
N
Midsummer setting Sun
a
b
c
Equinox Sun
To North and most Southerly setting Moon
Candlemass rising Sun
Midwinter rising Sun
Most Southerly rising Moon



15
Solar and lunar symbolism; after Llama Govinda.

The degree of accuracy put forward by Thom for the Castle Rigg orientations means that more precise techniques than the ancient Hindu vertical pole shadow method must have been used: for a discussion of this point see Thom.[17] However, the significance of the first two arcs in the Hindu procedure may have held a similar symbolic value in relation to the actual sun and moon orientations as Castle Rigg. Lama Govinda, the German scholar and Buddist who has become one of the most explicit interpreters of Buddhist psychology to the modern Western world, comments on the symbolic meaning behind the two overlapping circles. This interpretation ascribes universal consciousness (the realm of archetypes) to the first circle, and empirical consciousness to the second circle (that which 'sorts out and judges the results of the five kinds of sense consciousness') and finally *manas* to the area of overlap. Manas is described as the balancing consciousness that 'either binds us to the world of the senses or which liberates us from it'.[18] Manas has been etymologically linked via the archaic Indo-European language with the word man – the conscious animal.

Govinda has this to say about manas, the overlapping region: 'the double character of manas which, though being without characteristics of its own, becomes a source of error if it is directed from the universal towards the individual, or the opposite direction, from the individual towards the universal, it becomes a source of highest knowledge. The difference in the effect of these two directions may be compared to the vision of a man, who observes the manifold forms and colours of a landscape and feels himself different from it (as "I" and "there") – and the vision of another one who gazes into the depth of the firmament, which frees him of all object-perception and thus from the awareness of his own self as well, because he is only conscious of the infinity of space or of "emptiness". His "I" here loses its position through lack of contrast or opposition, finding neither anything to grasp nor from which to differentiate itself.'[19] Thus the individual becomes integrated with the whole. These directions along the ontological axis are featured in the archaic shaman religion which we shall turn to later.

If we now transpose the symbols for universal consciousness, empirical consciousness and manas (balancing consciousness) into sun, moon and human consciousness, we have a basis upon which to suggest how the geometrical procedure might relate to Castle Rigg. In doing so we must keep in mind two of Professor Thom's major ideas. The first is that the flattening of the circle enabled a whole or rational number to replace the 'irrational'* circumference of a pure circle. Thom believes the builders of the circles abhorred 'incommensurable' lengths. The second is his calculation of the megalithic unit of measurement used in the construction of the circles.

If Socrates found it so difficult to circumscribe justice in the perfect state, why should we believe the great intellectuals of stone-building ancient Britain found it any easier? The establishment of justice in the administration of human affairs is facilitated by the standardization of conventions for number, weight and measure. It is for this reason as well as the knowledge of man's need to understand the rhythms of the cosmos, (rhythms which pacemake all biological events) that we are led to accept Professor Thom's findings on the existence and size of the megalithic yard (abbreviated to MY). The megalithic yard integrates the function of a number of conventions and astronomical measurement through the alignment of the stars. The dimension he arrived at by a statistical method was one megalithic yard equals 2.72 feet. Without going into the process we can summarize that he distilled this figure from 383 surveyed sites to an accuracy ±0.003 of a foot. 'It is fortunate for us' writes Professor Thom, 'that megalithic man liked, for some reason or another, to get as many as possible of the dimensions of his constructions to be multiples of his basic unit.' This was written in 1955, and all his subsequent work appears to confirm his calculation. He later introduces an interesting set of variations on an Iberian offshoot or related megalithic yard called the *vara* which is believed to have survived through the Spanish invasion and settlement of South America. Values, in feet, for the *vara* published by Professor Thom are as follows: 2.766, Burgos; 2.7425, Madrid; 2.749, Mexico; 2.778, Texas, California; 2.75, Peru. Like the yard and the French *verge*, the Spanish *vara* has an etymological root in 'a rod' which is much the same as the recently abandoned 'yardstick' of Britain and America. As for the medieval cathedral builders, the carrying of the measuring rod and compasses was the sign of authority and mastery and there is no reason to believe that peoples who could fashion such precise stone-tools and work decorative bone-ware were not capable of fashioning equally precise measuring rods.

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16
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There were two 'prehistoric' measuring rods found, one in a Early Bronze Age burial mound at Borum Eshoj in East Jutland, Denmark which was described, by P. V. Glob in 1875 when it was uncovered, as being 30.9 (Danish) inches in length. Glob believed it was used to lay out the circular burial mound and thrown into the grave on interment. E. Mackie calculated that 309 Danish inches is 32.01 British inches or 0.813 metres and so the length of the rod on discovery was 0.63″ shorter than a megalithic yard – this may well have been shrinkage over the 3,000 years within the grave.[21] The date has been estimated at the second millennium B.C. Further interest is added by the fact that the rod is notched as follows: 1/5, 1/5, 2/5, 1/5. Mackie remarks that this could be a connection with the Sumerian *shusi* as each 1/5 would be equivalent to 10 such *shusi*.

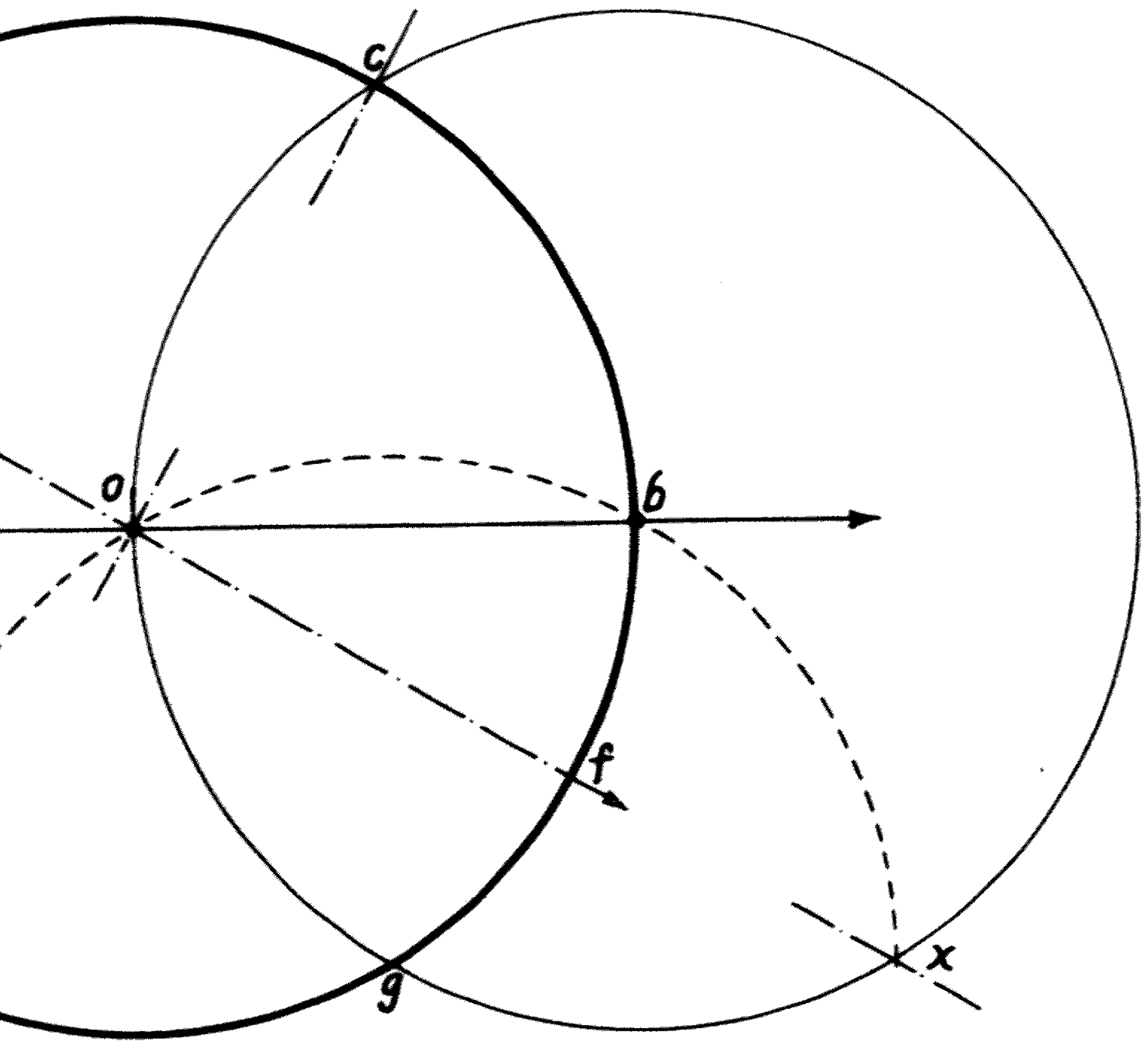
The second wooden rod is of the Iron Age and excavated at Borre Fen, a fort in Himmerland. This rod of oak was 53.15″ with a button at one end and pointed at the other, and in this case divided into eight equal parts. Each division is given as 6.5″ a pair making up 13.0″ or a large foot. Yet if the total is equally divided the figure should be 6.64″. In this case five eighths of the rod would total 32.5″ (or possibly 33.2″), as Mackie says, 'very close to the megalithic yard'.

2.4 Testing the Ground Rules

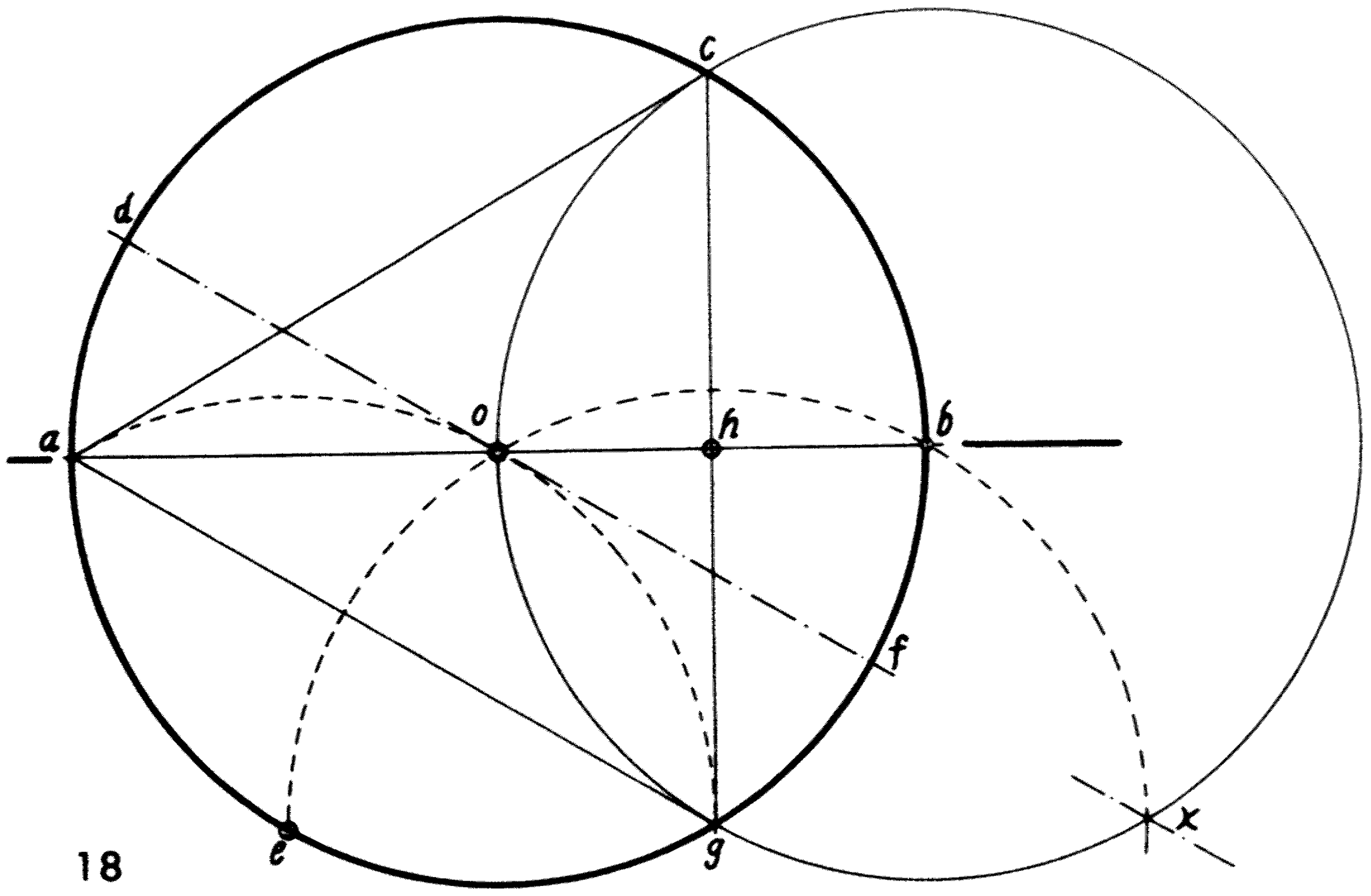
Taking the clues offered by the Hindu manuscripts in conjunction with Professor Thom's survey we will try the implication of these findings on Castle Rigg.

The builders of Castle Rigg found a site with a convenient horizon for measuring the exact sun-setting axis on midsummer day. This is the key axis of the year for it marks the turning point of the light of the sun. The winter solstice is of equal cosmic importance but at the summer solstice the sun is at the height of its power, clearing the skies for uninterrupted measurement. From this axis (**df** in diagram 17) a precise calendar can be constructed.

16
Aerial photograph of Castle Rigg (Cambridge Air Survey, Cambridge University).



Castle Rigg.



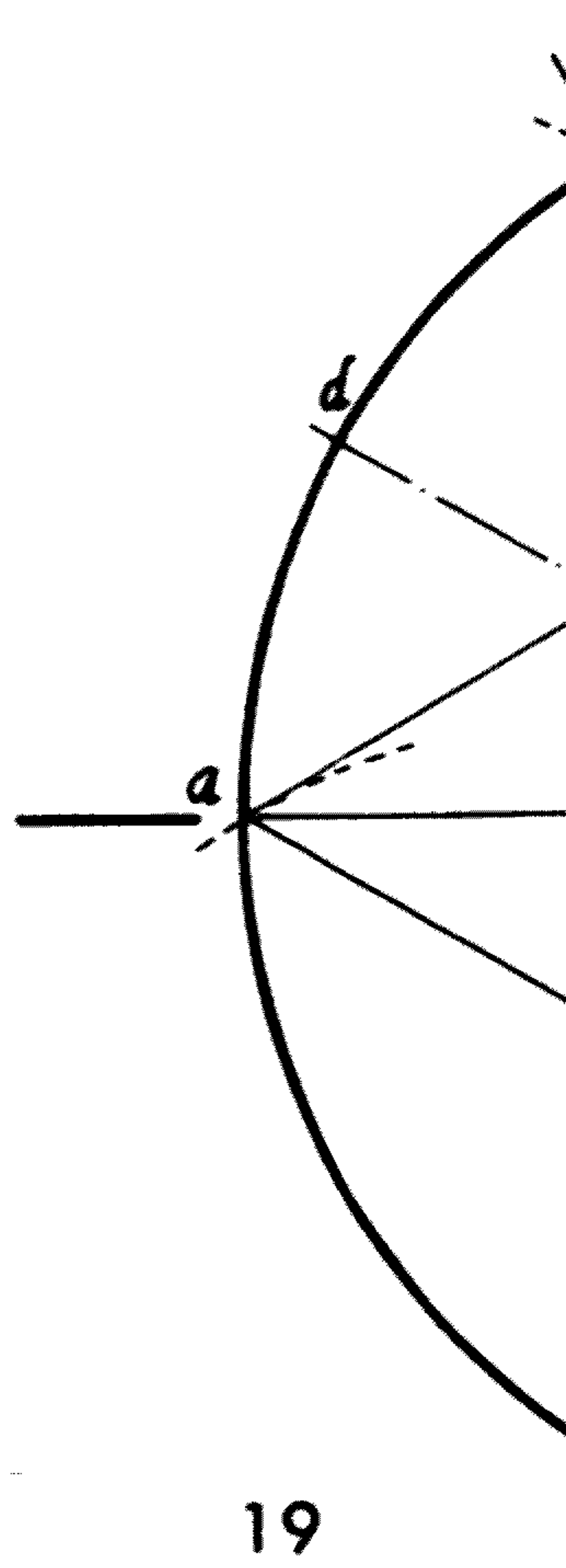
18

A full circle is drawn from centre **o** which we will propose symbolizes the solar circle (fig. 17). Although this 53½ foot radius circle produces an irrational diameter (in terms of megalithic yards) this appears to allow the lunar orientations to be determined by the second circle which, according to our proposed symbolism, would be traditionally the moon circle. This is constructed by placing its centre on the periphery of the solar circle at point **b**. The reason for the original radius becomes clear as our second circle establishes the moon sighting (most southerly rising moon) in this particular location from the direction **ofx**. Having chosen the centre there would be only one radius that could produce this most southerly moon-rising axis and be part of the geometrically rational scheme uncovered by Thom.

In our illustration we have drawn the 'solar' circle (the main geometry of the stone circle), diameter **ab**, in heavier line and the secondary 'lunar' circle, radius **ob**, in the lighter line. Also shown is the next stage in the construction (with a dashed line): the drawing of a semi-circle of similar radius centred at **g** which indicates points **x** and **e**. This latter arc, by cutting the 'lunar' circle at **x**, gives the most southerly moon-rising axis **ofx**. Not only does it perform this function but it also sets up the 67 degree azimuth axis of the whole construction by cutting the solar circle at **e**. The line **eoc** is the central axis of the final flattened circle, and is 67° from the true north.

If the arc making device (fig. 18) is now placed on point **e** and the second arc drawn from **g** to **a**, without changing the radius this re-affirms the midsummer solar setting axis (**boa**) on the opposite side of the 'solar' circle from the centre of the 'lunar' circle. Joining directly points **a**, **c** and **g** we obtain a perfect equilateral triangle pointing both in the direction of the symmetry of flattening toward **c** and the summer solstice sunset toward **a**. This also gives our *third* centre for obtaining the flattening, point **h**, which is the exact middle of the intersection of the solar and lunar circles—the original post position in the Hindu ritual. (The second centre for the flattening was at **e**.) These centres are required to construct the continuous outline used for placing the stones in their final 'flattened' form.

The next arc in our procedure (fig. 19) is inscribed from **e** with centre **a**



19

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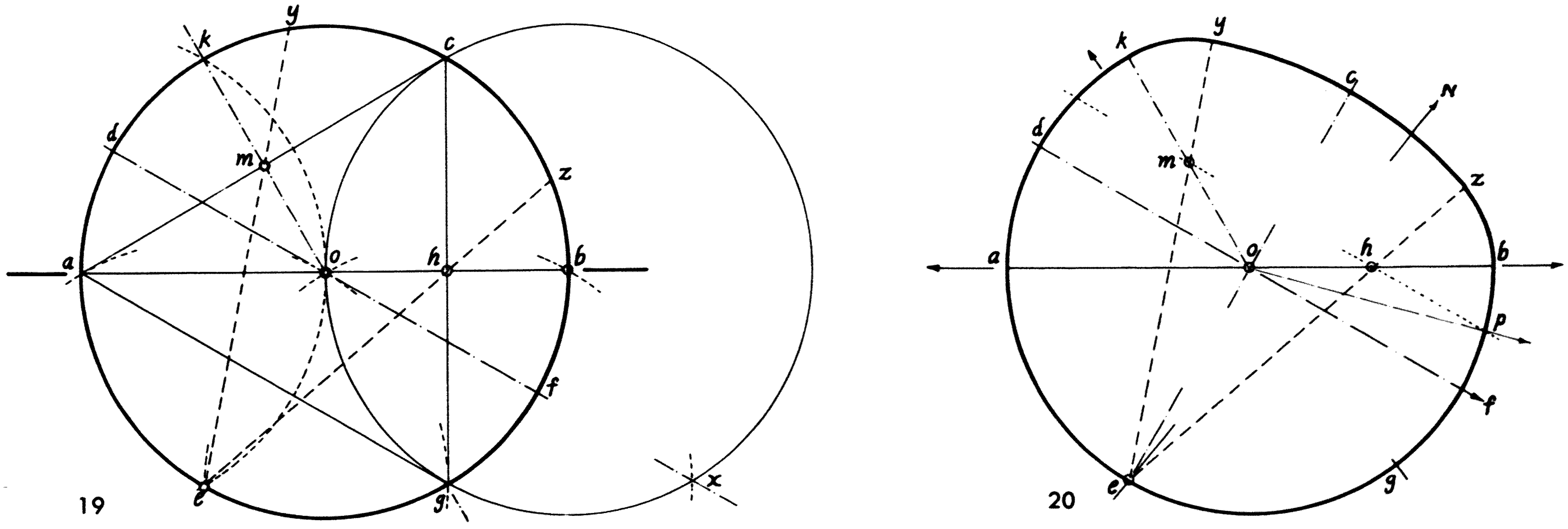
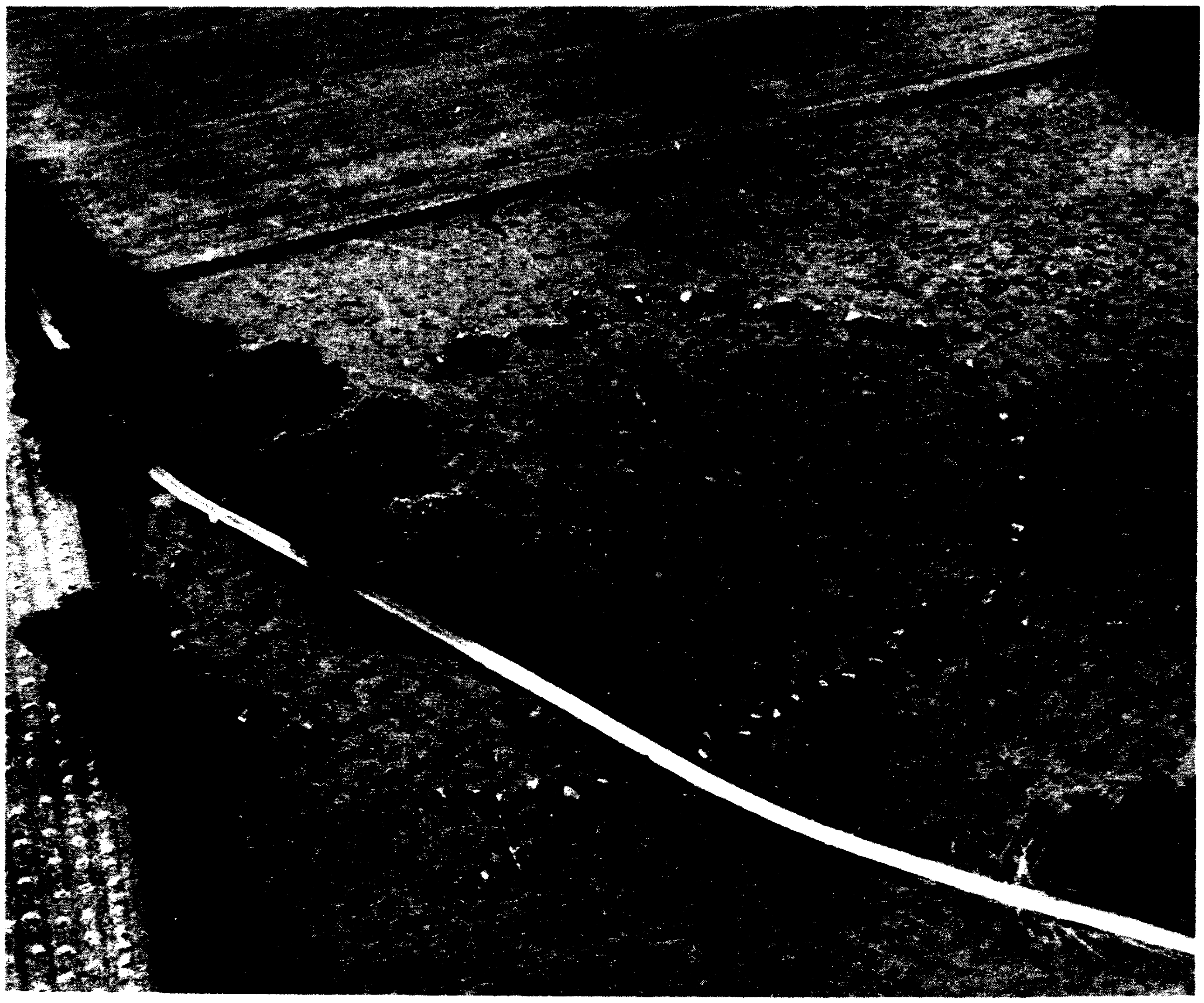


19/20
Geometrical analysis of Castle Rigg based on Professor Thom's type A system.

through to **k**. If we now join **ok** both **ac** and **ok** are bisected at **m**. Point **m** is our fourth and final centre for the construction of the complete flattened circle outline.

We now have four positions and the appropriate radii to construct the shape which Thom calculated statistically most fitting for the existing pattern of stones. In terms of reconstructing the original ritual, the final shape can now be inscribed or ploughed more heavily into the ground. Starting with our original circle, only a proportion of the perimeter is used which is represented by an arc that travels from **b** (the centre of the 'lunar' circle) clockwise round to position **k**, the whole centred on point **o**. With point **m** (fig. 20) becoming the next centre (radius **mk**, that is half the first circle radius) an arc is drawn to point **y**, whose position is determined by a line from **e** passing through **m**. At **y** the continuity of the shape is taken up by moving the trammel to centre **e** and engraving an arc from **y** through direction point **c** to point **z**. Position **z** is obtained in the same way as was position **y**: from **e** through **h**. At **z** another small arc with radius one half of **ob** and centre at **h** is drawn through to our starting-point at **b**. It is on this flattened circle that Thom proposed the positions of the enclosure of stones were set. Of the 31 stones still standing, 25 are either intersected by this construction or are tangent to it. Allowing for frost movements and deliberate deviations (the reasons for which are yet to be discovered) we find this degree of conformity statistically satisfactory to verify Thom's hypothesis.

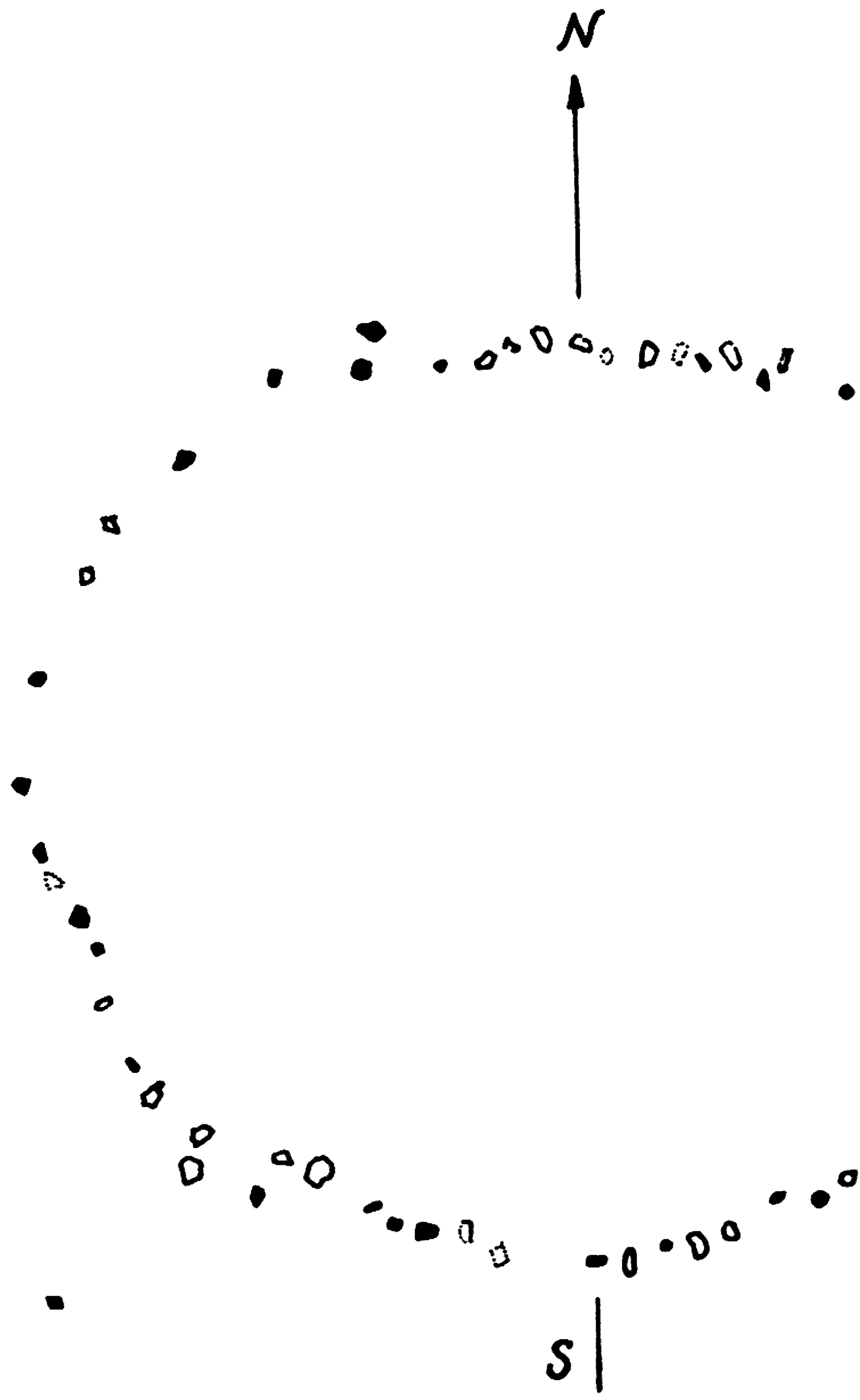
There is a clue to what may have been further alignments in an arrangement or 'cove' within the circle on the eastern side (see fig. 13). Thom demonstrated (fig. 20) that, should a line be drawn through points **m** and **h** and extended to the outer circle at **p**, we find a stone conveniently placed to sight over from the centre of the construction **o**. This line not only establishes the innermost limits of the cove but, in addition, the direction **op** gives a reading for the midwinter rising sun, the day of rebirth of the year. The equinoctial rising sun can be read over a stone at point **b** on which we established our construction and this axis **(ob)** also passes through three stones of the cove.



A neighbouring circle to Castle Rigg is Long Meg and her Daughters. Compared to some of the circles such as Allan Water and Moel Ty Uchaf, it is very large and is dominated by the huge presence of Long Meg herself, standing clear of the enclosure of her daughters.

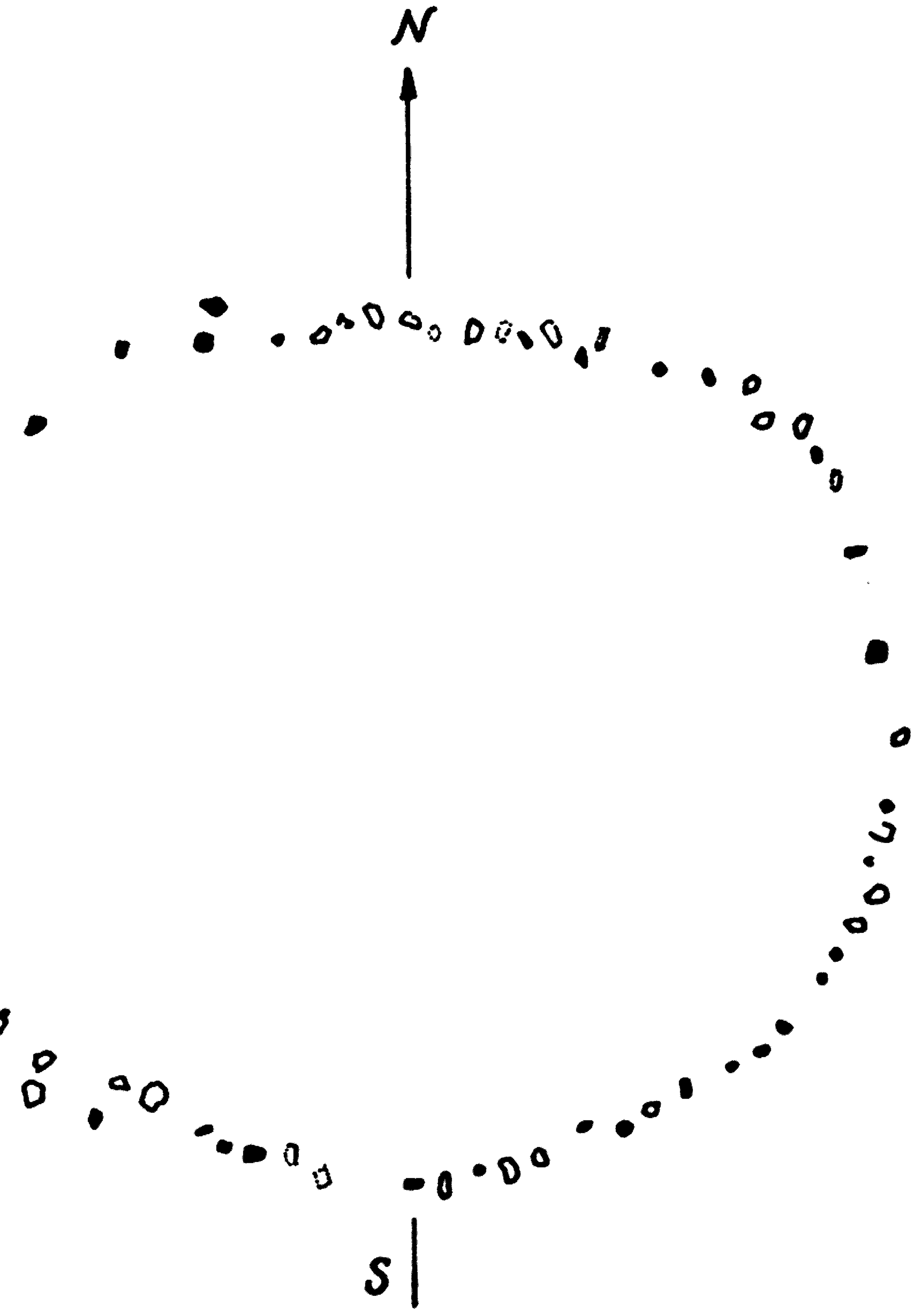
Long Meg's daughters (fig. 22) conform to Thom's type B flattened circle and can be constructed with a fair degree of accuracy according to the procedure of the *Mānasāra Shilpa Shāstra* (fig. 23). The Hindu document prescribes that a circle would have been drawn around a gnomon pillar at the centre **z**, following which full circles are drawn centred at **a** and **b** (the east-west axis points) on the centre circle corresponding to those proposed by Thom. These two are not *precisely* east-west as the Indian document would have them, but when the north-south axis, which falls somewhere between true and magnetic north, is put in, using the upper and lower intersections of the fish-shape (**c** and **d**). We have drawn in the east-west arcs also to conform to the Indian practice, though the early British builders were obviously not concerned with making a square enclosure. There is however a possible function for position **t** as a centre to which we will return.

From here the procedure takes on a characteristically Hyperborean tone (fig. 24) and we see how the flattened circle is developed. Returning to the centre **z** and taking the most westerly and easterly points of our first two circles, **g** and **f** respectively, we have a new diameter set for us. We now follow the procedure, according to Thom, and cut a large semi-circle to the south from **g** to **f** with centre **z** and complete the Thom type B construction by linking the northerly points **w** and **v** with an arc centred at **e**: **w** and **v** are located exactly by respective axes from **e** through **a** and **b**.



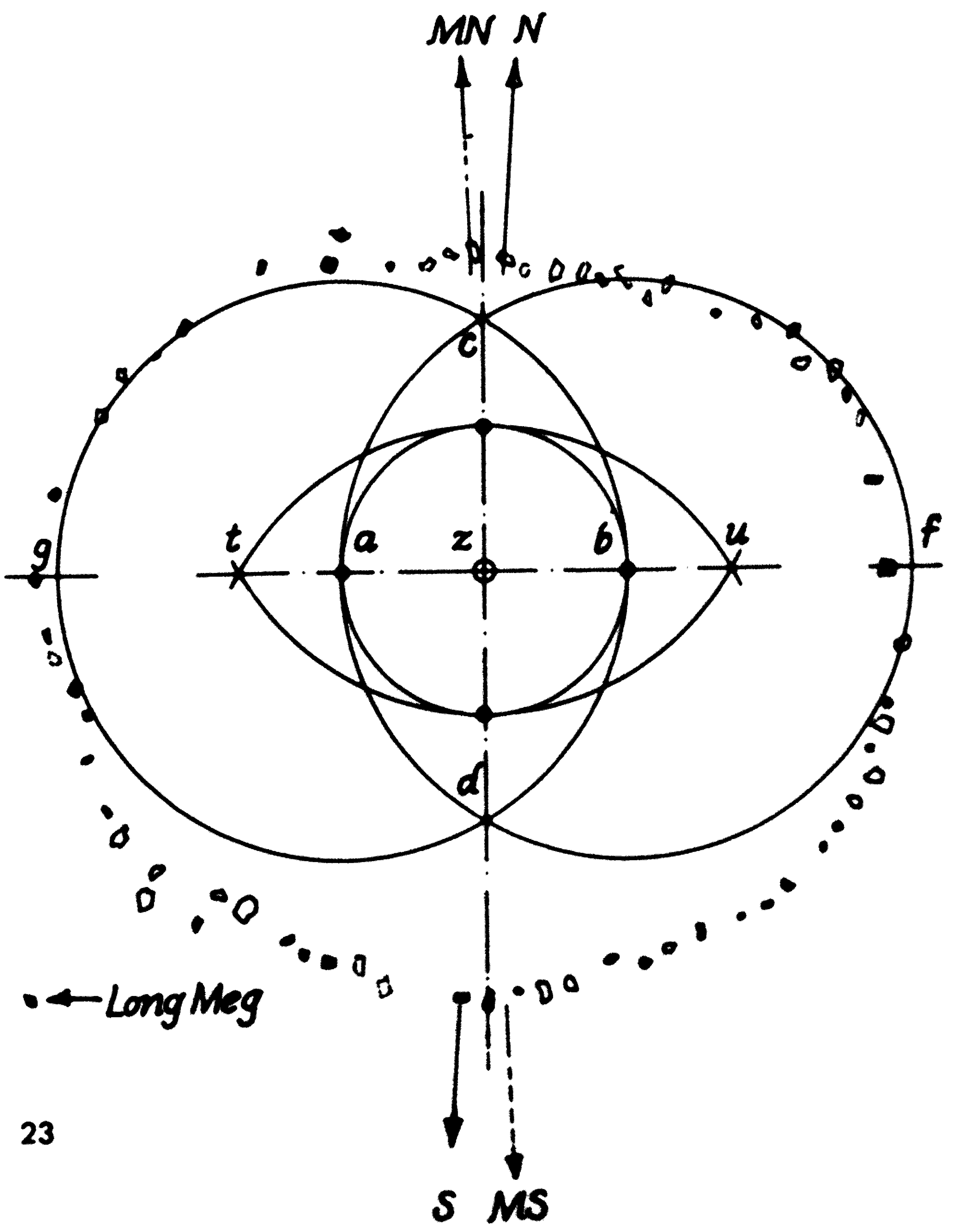
22
Long Meg and her Daughters; survey after Professor Thom.

23/24
The setting out of Long Meg and her Daughters.



g and her Daughters; survey after
Thom.

g out of Long Meg and her Daughters.



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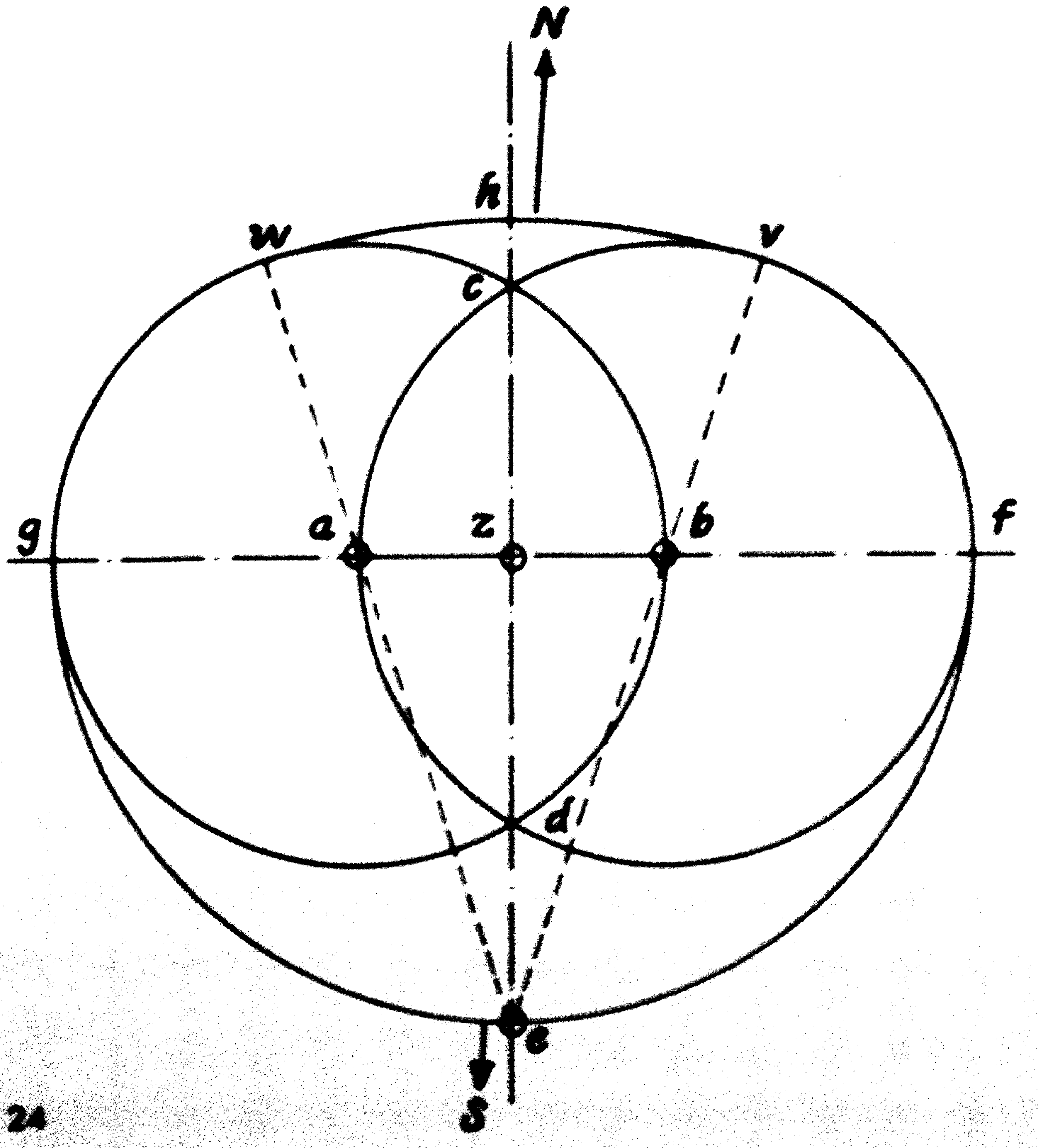

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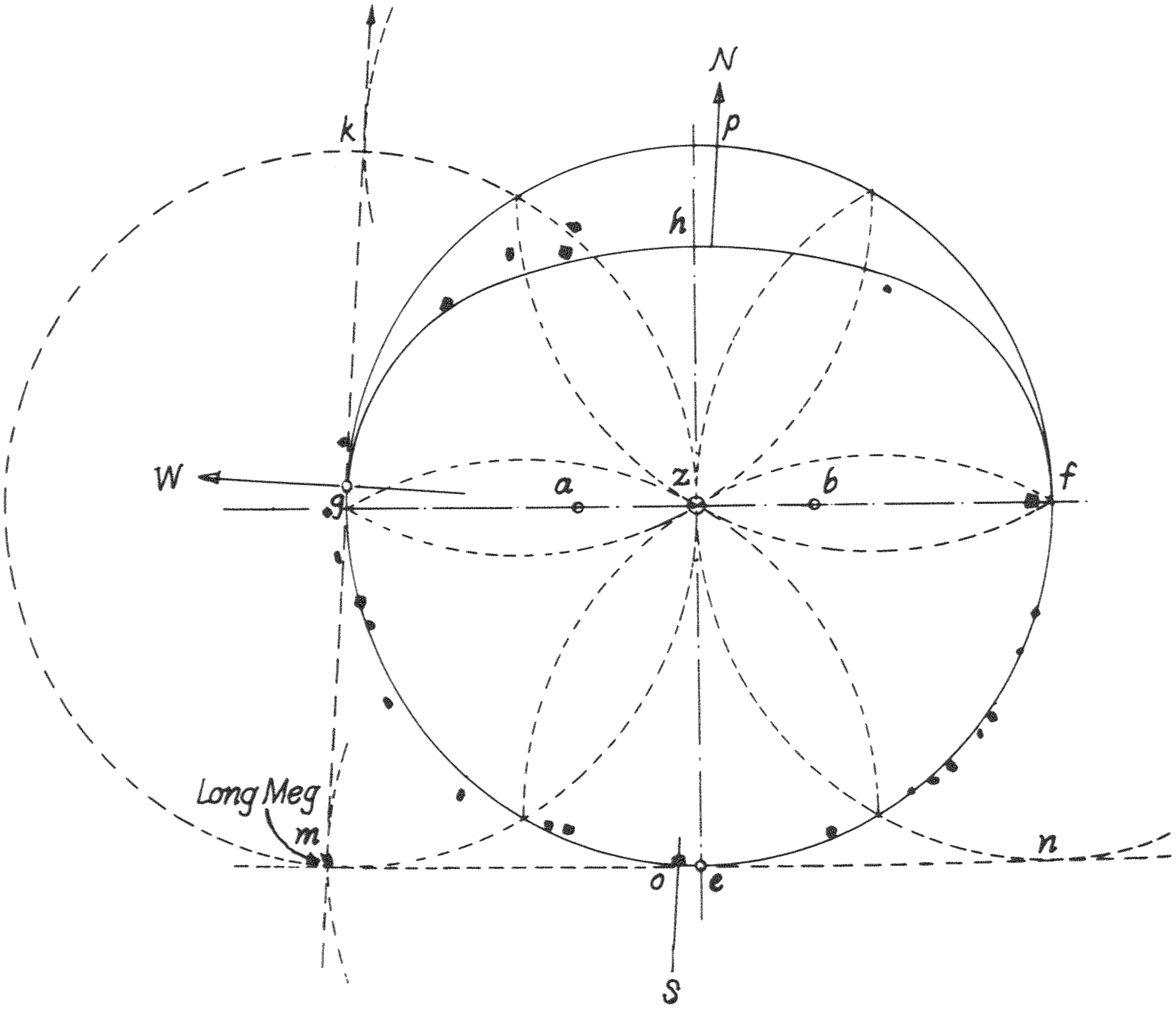
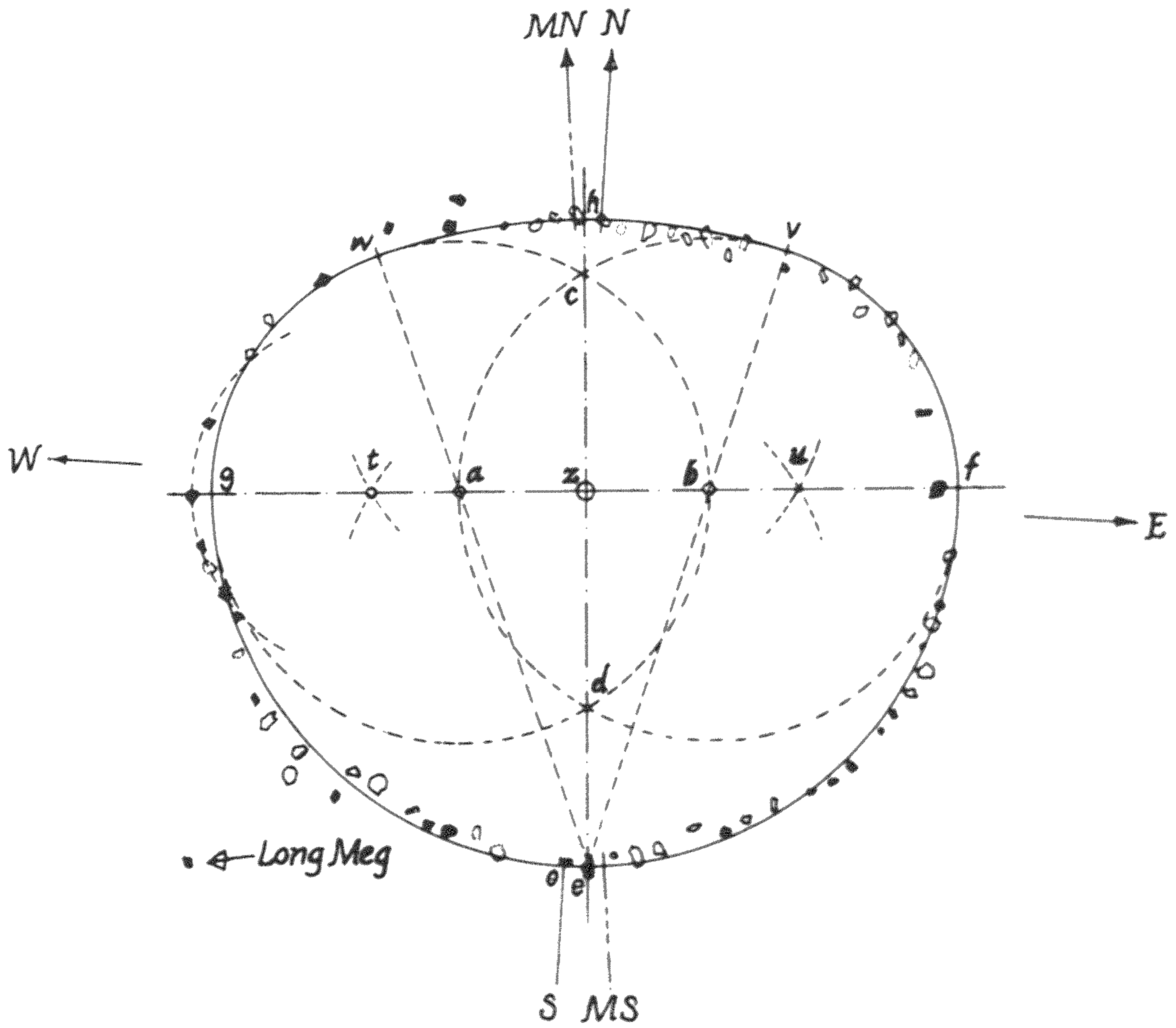
25
The setting out of Long Meg and her Daughters.



We have still to locate the most dramatic member of this community, Long Meg herself, in the scheme of things (fig. 25). By exploring the natural divisions of the *full* circle diameter **gzf** and taking point **g** as the centre for a full circle of the same radius it marginally encloses Long Meg at its most southerly point. Now, by observing true north and taking the south direction from the centre **z**, we cut the large circle at stone **o**. By placing the compass on this south point of the circle we find that our arc of the same radius cuts right through Long Meg. If we do the same from point **p** to establish point **k** at the northerly extreme of the dashed circle, this north point sets up a true north tangent to a point due west of the centre **z** (just north of point **g**) sighting just inside the three deviant stones outside the circle to the west. Meg is thereby due south from point **g**. So we can say Long Meg is aligned in the sense that she is due true south from the westernmost point of her daughters' circle.

Finally we have the complete construction (fig. 26) with the suggestion for a possible function for point **t**. We find if we draw a circle centred at **t** with an approximate 85-foot (31 ¼ MY) radius, it intersects the three stones outside **g**. Strangely, the eastern axial stone (inside **f**) does not conform to this circle geometry, yet it does fall on the axis. Maybe this was deliberately done to establish the distance between the outer extremities of these two stones which curiously measures 365 feet. Unfortunately this idea causes more problems than it solves as we have no particular evidence of the use of the British foot at so early a date. The dimension's reflection of a solar figure

26
The setting out of Long Meg and her Daughters.



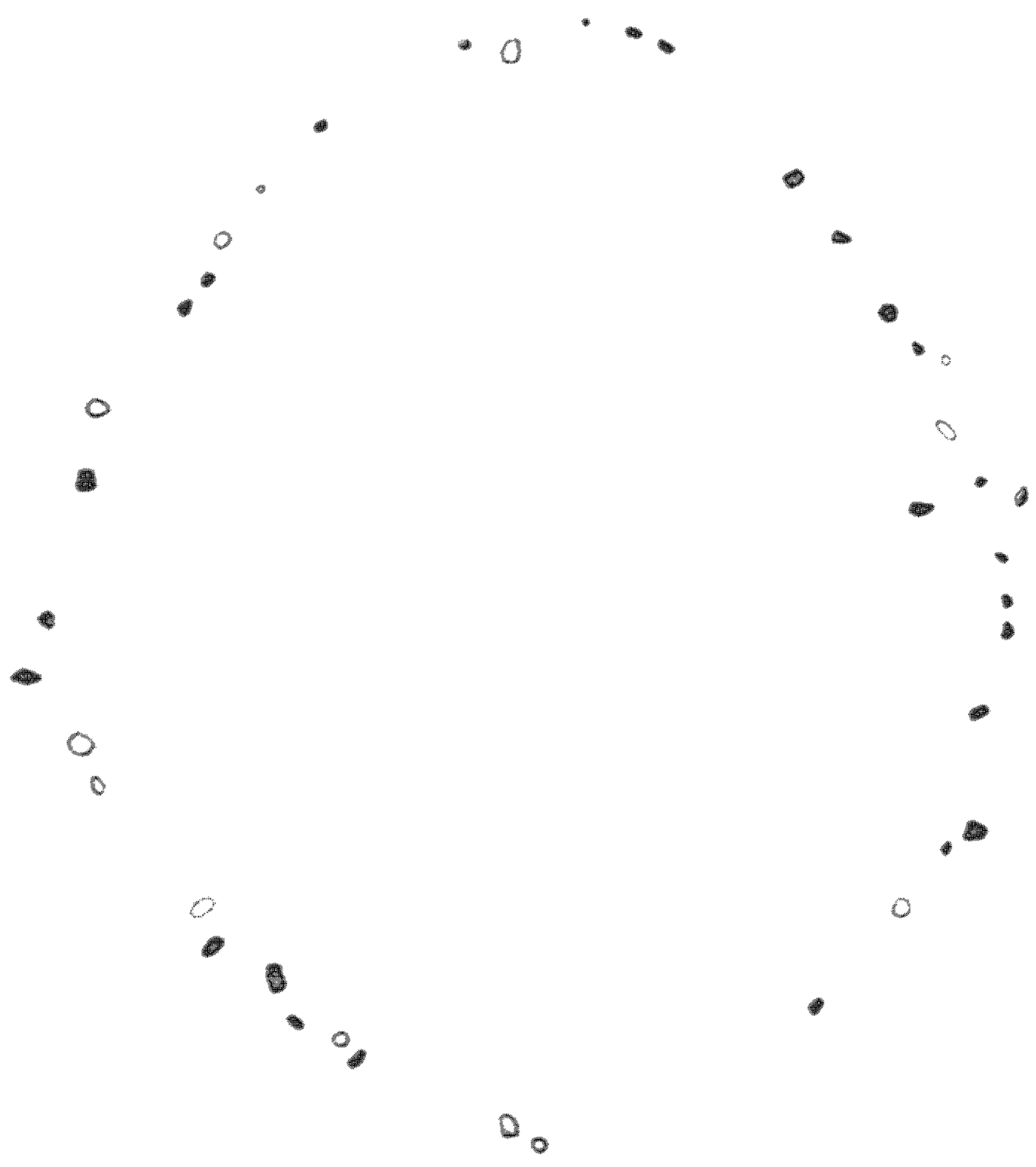
for the days of the year, however, puts it well within the bounds of possibility. After all, the foot is reputedly a *human* measure whatever other claims may have been made for it, and we can be certain that the megalithic builders also paced across these sacred areas on their feet!

Also, because **zb** is one-sixth of **fg**, the diameter of the 'solar' circle, they represent a division into twelve equal parts of the whole circle, which could be interpreted as the twelvefold division that is traditionally called the fixed stars. These are the background of 'static' constellations against which astronomers measure the transits or movements of the sun, moon and planets of our system. Thus with amazing adroitness, no doubt the result of long deliberation, two intersecting circles and a third linking arc, all of the same dimension, simultaneously establish a fundamental orientational pattern and become the basis of a totally integrated symbolic and physical system.

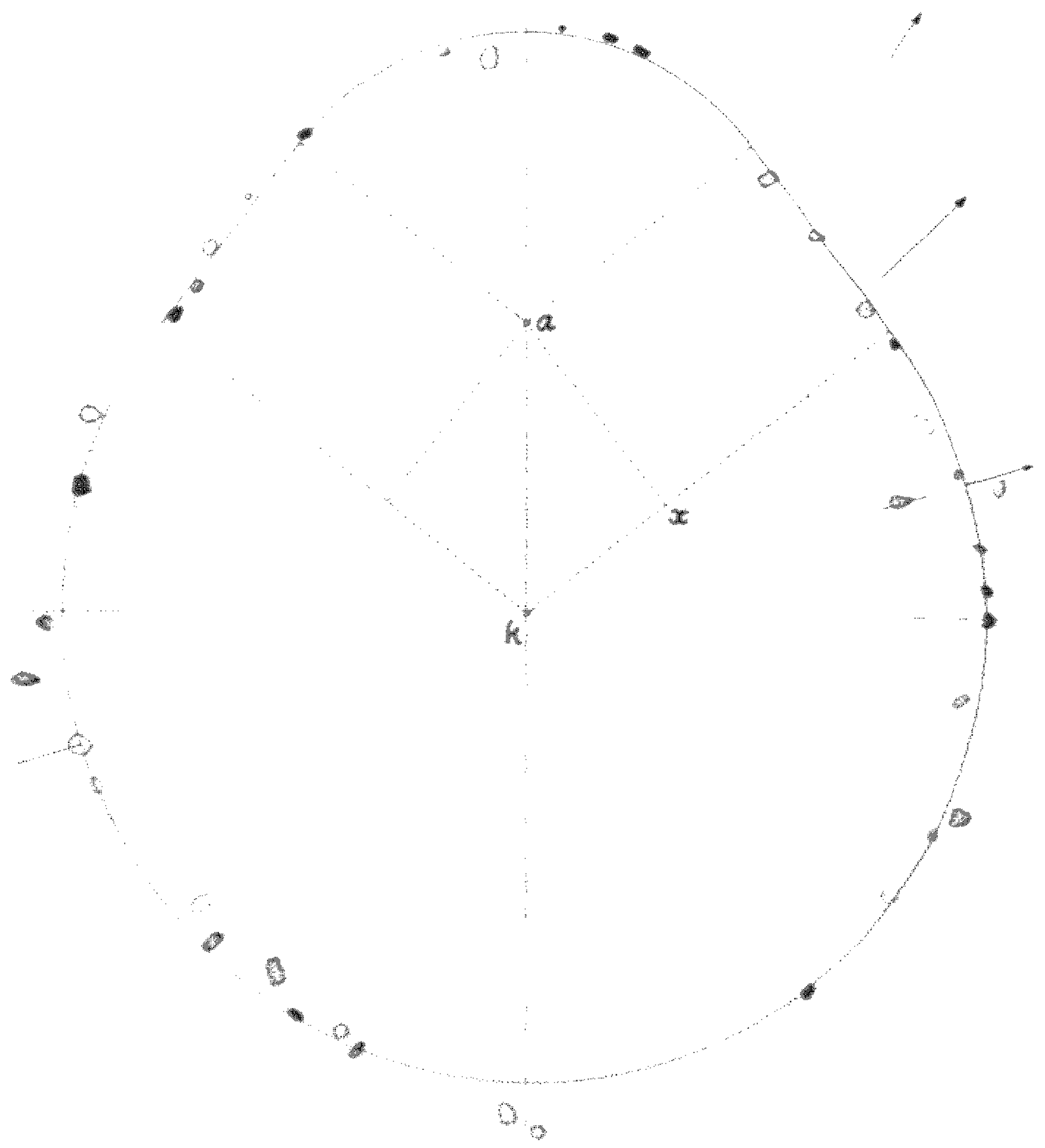
Now we turn to the Midlothian circle known as Borrowstone Rig (fig. 27). Although there are only ten stones remaining upright in this unusually large enclosure they all accord well with Professor Thom's proposed geometry for a type II egg-shaped ring. Taking the survey of Professor Thom as our starting-point we accept the hypothesis in principle of the two circles which are found by straight lines as the determining geometry of the 'circle'.

Firstly we explore the possibility of a method for 'founding' this geometry (fig. 28) which would be similar in principle to the ancient Vedic method as

27a
Borrowstone Rig; survey after Professor Thom.



27b
Professor Thom's proposed geometry.



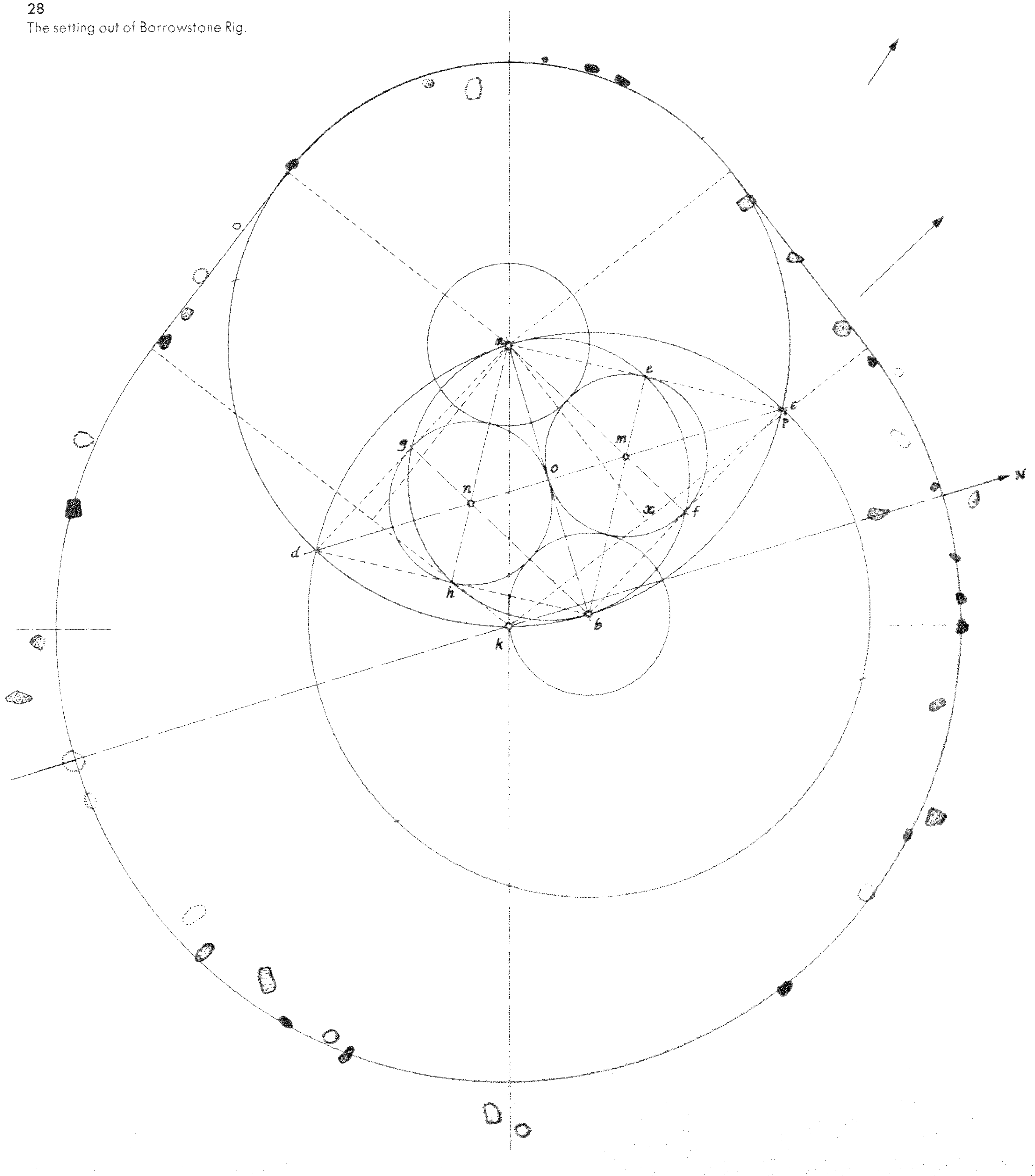
recorded in the *Manasara Shilpa Shastra*. This means that the diameter of the primary circle of the Vedic method (**aob**) is the same as the radius of the smaller circle as suggested by Professor Thom in the establishing of this circle as a type II egg-shaped ring, i.e. 15½ MY.

If we follow the procedure for orientation – the cardinal directions as described in the ancient Vedic manuscript – we would expect a shadow pole to be set at **o**, next a circle described around it with diameter **ab** (in this case 15½ MY), followed by the establishment of the east-west axis by the tip of the shadow of the central pole cutting the circle in the morning and evening respectively. Having transferred this axis through the centre of the circle at **o** two circles of 15½ MY radius are now inscribed, one with a centre at **a** and the other with its centre at **b**. The **a** centred circle is identical to the small arc Professor Thom proposes for the overall 'egg' form of the structure. Next the change in orientation of the overall 'egg' form needs establishing as its central axis is not due east-west but rotated some 12 degrees south of due east and north of due west. The following proposal is suggested for this shift in orientation: the two circles with radii of 15½ MY with centres **a** and **b** intersect at **c** due north from **o** and at **d** due south from **o**. If one then connects these four points **a**, **c**, **b**, **d**, a 'diamond' form is described which is made up of two equilateral triangles **abc**, **abd**. Next the centre line of this 'diamond' form is drawn from **c** to **d** followed by the two further axes of symmetry of each of the two equilateral triangles: from point **b** to point **e** and from point **a** to point **f** in the triangle **abc**, and similarly points **g** and **h** connect to **b** and **a** respectively in triangle **abd**. This establishes two new centres for smaller circles, **m** and **n** respectively. The sizes of the circles are obtained by a radius equal to **mo** and **no**, respectively. When inscribed these circles cut the original circle (diameter **ab**) at the very points **e**, **f**, **g**, and **h**. Now the point of this procedure is to inscribe this smallest circle at centre **b**. Because when we do so it cuts the largest circle with centre **a** at the point **k**. Now a line which passes through **a** and **k** becomes the central axis of the overall 'egg' geometry of the stone 'circle' and point **k** becomes the centre of the larger of Professor Thom's proposed arcs for the larger arc of the 'egg' construction, that is a circle with a radius of 25 MY. The north-south axis can now be transferred to point **k**.

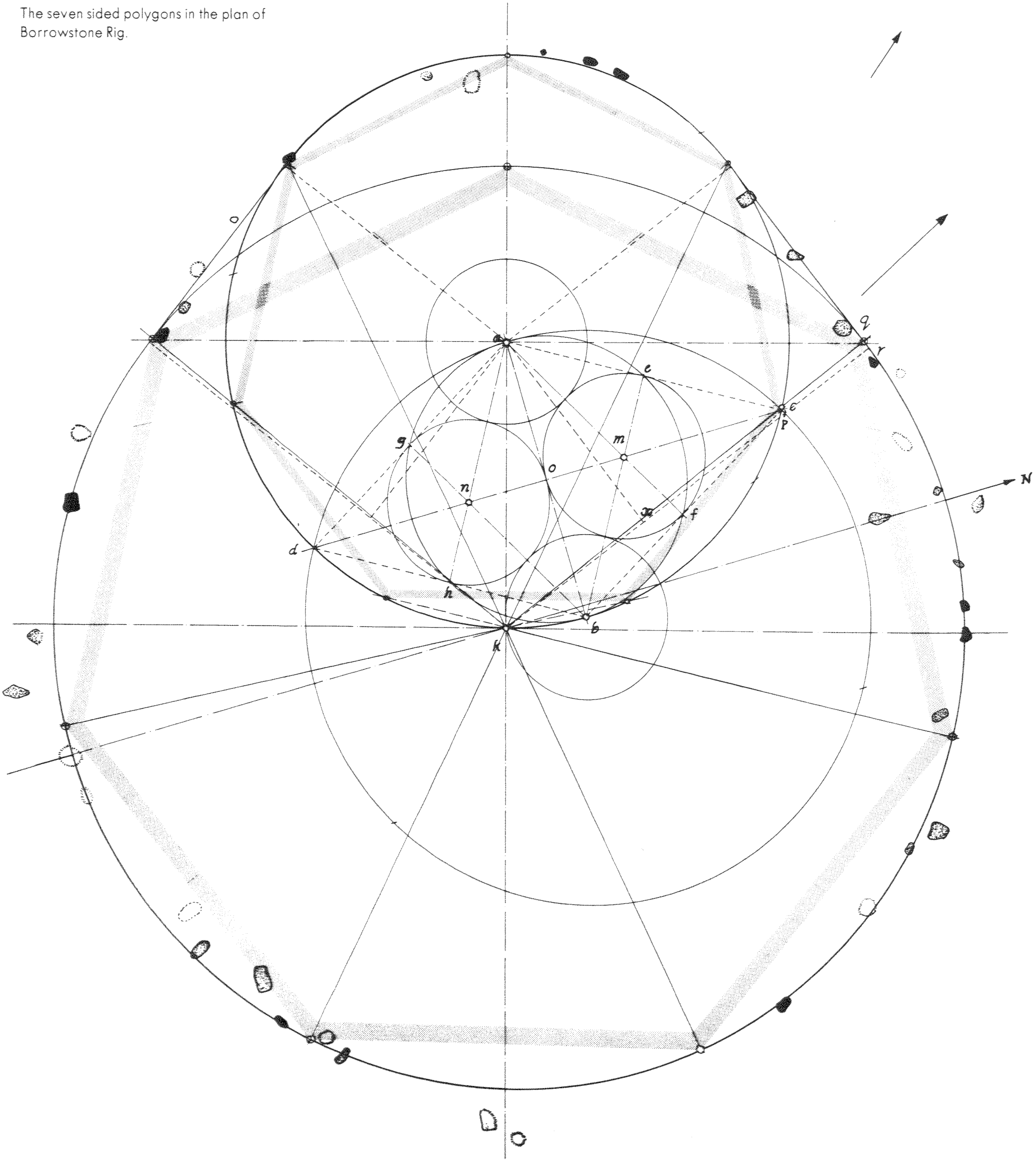
Professor Thom has remarked how unusual this particular construction is (fig. 27b) and the very small, hardly perceptible, discrepancy in the Pythagorean triangle **akx** whose sides are 15½ MY, 12¼ MY and 9½ MY. If one squares 15½ it equals 240.25 and if one squares 9½ it equals 90.25 which when added to 12¼ squared (150.0625) totals 240.3125 giving a Pythagorean discrepancy of .0625 or 2 inches! Nevertheless this discrepancy could be taken as a hint that other values, both geometric and numerical, were being incorporated into the layout; there would be no obvious reason why any discrepancy need be built into such a construction as 'perfect' Pythagorean triangles were normally used at this time.

A critical comparison between the Vedic procedure described above and the geometrical construction proposed by Professor Thom reveals that point **c** (the northern intersection) is about ¼ MY west of Thom's northerly limits of the radius of the greater arc of the egg construction (from a point marked

28
The setting out of Borrowstone Rig.



29
The seven sided polygons in the plan of Borrowstone Rig.



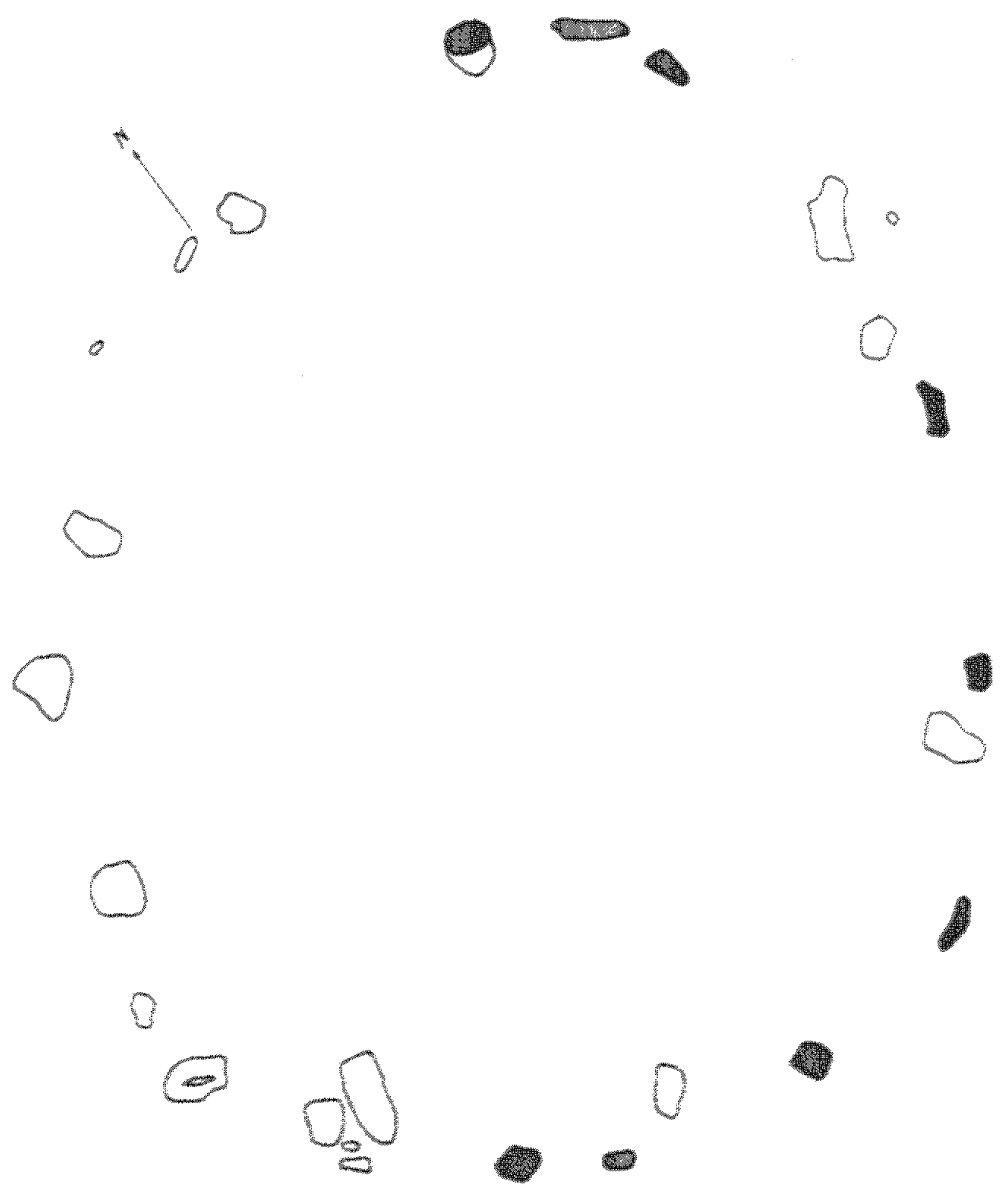
p), that is one degree from centre **k**. Moving less than half a degree further to the west from centre **k** gives another remarkable coincidence: the close coincidence of the geometry proposed by Professor Thom to two-sevenths of a circle in the smaller arc and five-sevenths in the larger. The closeness of the three 'processes' led us to believe that they were deliberate ingredients: that is the Vedic orientational procedure, the Pythagorean triangulation and the sevenfold division of the circles, each contributing to the 'cosmological' significance of reconciling 'rationals' and 'transcendental' values through geometry and number.

The diagram 29 demonstrates the sevenfold interpretation of the completed circles proposed by Thom for the arcs of the 'egg' form. The precise sevenfold geometry moves away from the Pythagorean triangle but fits the overall profile quite as accurately. Interestingly the centre axis of the smaller western circle, set at right angles to the main axis of the egg form, more nearly coincides with the sevenfold division point **q** than the Pythagorean tangent point **r**. From the developement of the thesis of this book the appearance of the heptagonal pattern integrated within the temple shape should not be surprising due to the traditional cosmological significance this number holds. However, the subtlety of meaning this particular shape held for the builders – the way one sevenfold symmetry 'grows out of' the other – is still far from understood but our diagram shows certain linear symmetrical coincidents between the two sevenfold divisions of both smaller and greater circles which add to our admiration for the 'mathematics' of the builders.

From Borrowstone Rig we travel across Midlothian to another, smaller but beautifully egg-shaped enclosure known as Allan Water, high up on a hill above the lake that lends its name to the site (fig. 30). Allan Water has nine stones still standing in their original positions and at least twelve stones of a similar size lying recumbent around the perimeter.

Although this is the fourth site we are analyzing it was in fact the first to be discovered to have a star polygon in its construction. Llewelyn Vaughn-Lee, whilst a student and co-researcher of the author, had the insight to see the nine-sided star polygon within this particular circle. From this insight our analyses have developed. It is of interest to note that our three examples have minor discrepancies as far as the strictly megalithic yard interpretation of Professor Thom is concerned, as he readily points out in his own book. We believe, however, that these serve to reinforce the general thesis of megalithic man's mathematical ability, as they are seen to be an adjustment to achieve an even subtler embodiment of form in the circle temples.

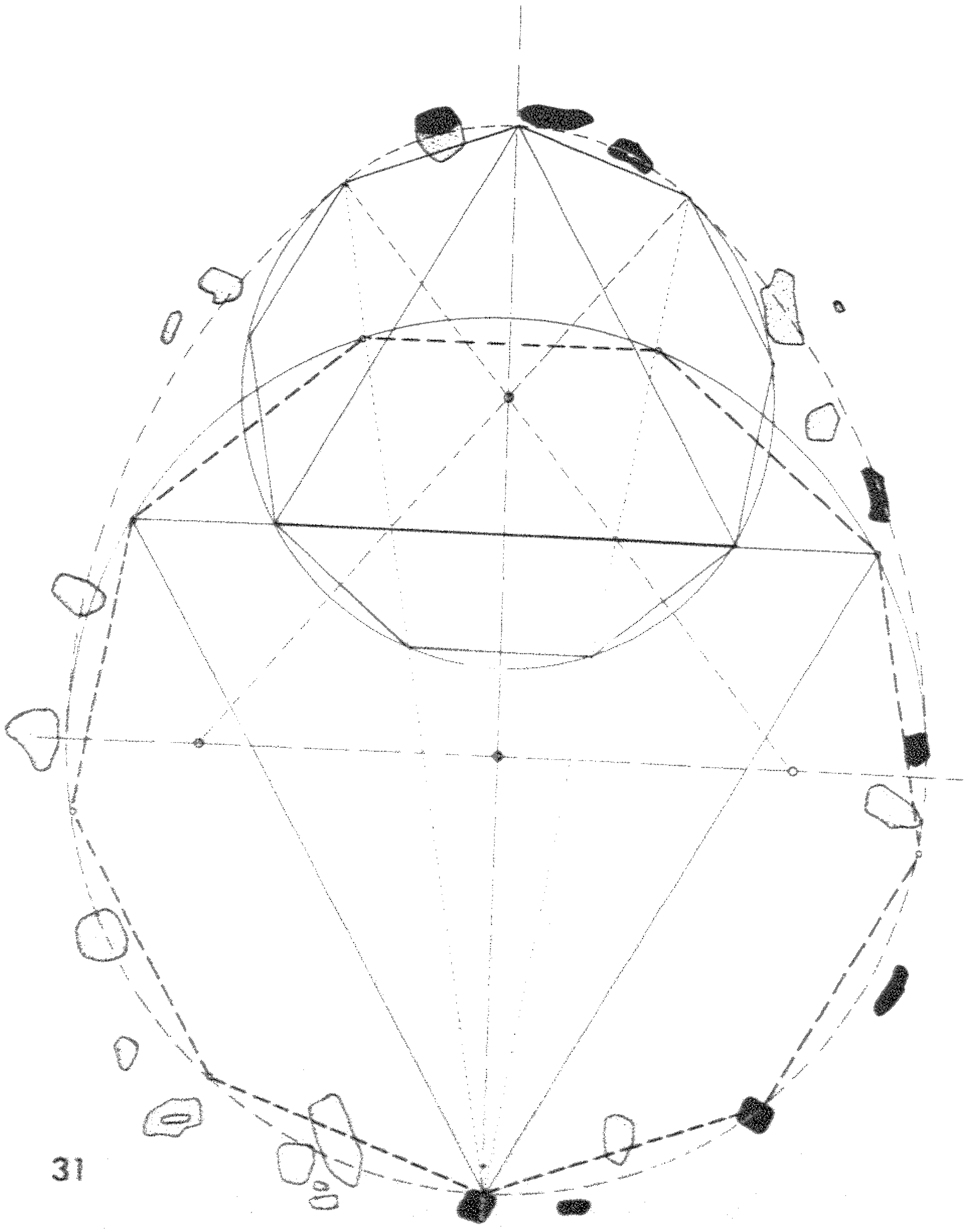
A close look at this circle of Allan Water (fig. 31) reveals the subtlety of its reconciliation between geometry and arithmetic. Thom points out that a different unit of measure, in this case ½ MY, was taken for this form, in itself an interesting fact, and this produced an imperceptible discrepancy of 1 in 580 which we could consider an adjustment to allow the smaller arc to achieve its ninefoldness. This gives a breathing space between the numerically 'irrational' (transcendental) geometric proportion and the 'rational' measurements of megalithic yards.



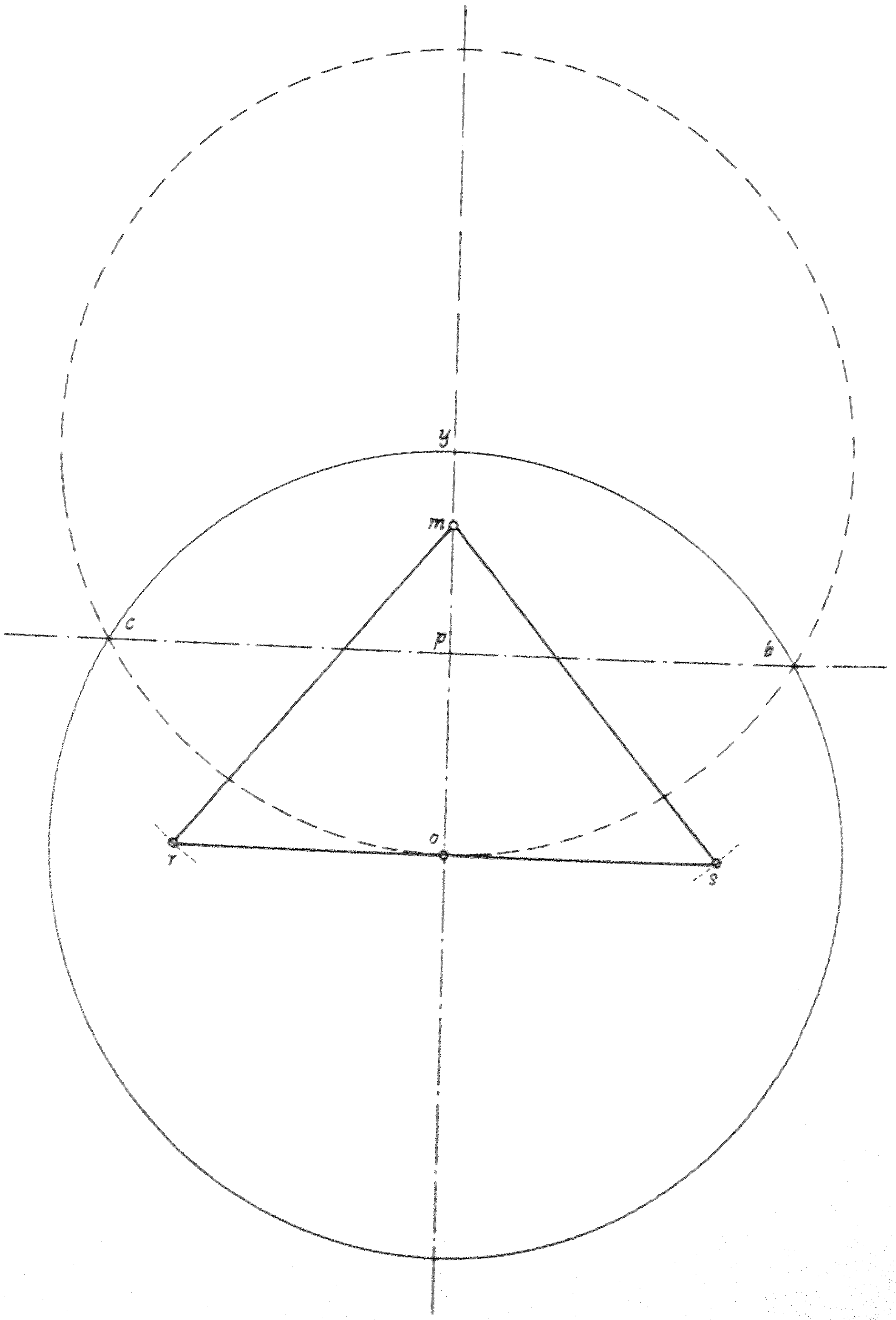
30
Allan Water; survey after Professor Thom.

The following (fig. 32) is a schematic representation of Thom's proposals for the controlling geometry parallel with the development of the main divisions of the enneagon (nine-pointed star). We propose to use the two overlapping circles with their symbolisms of sun and moon, but not in this case giving rise to the cardinal directions. As we proceed, however, the north direction does become established.

Thus with centre **o** and a radius of 8 MY we draw the primary circle. Taking the same radius and placing the new centre **y** on the upper periphery of the primary circle a new circle is drawn which intersects the primary circle at points **b** and **c** and creates our recurrent fish-shape. The central axis of the fish **(cb)** cuts the central vertical axis in the drawing at point **p** which is 4 MY above the primary centre **o**. Having established point **p**, the exact centre of the fish-shape, the next procedure is to establish a tangent to the lower circle at **o** at right-angles to the vertical axis. We suggest that the builders could have taken 2½ MY up from the point **p** towards **y** to establish the centre **m**. It is at this point that the Pythagorean triangle suggested by Thom enables us to establish the right angle at **o**, by firstly, with centre **m**, cutting two arcs of 8½ MY radius thus approximately fixing points **r** and **s** as falling somewhere on these arcs. Secondly, with the trammel centred at **o** and with a radius of 6½ MY two further arcs are drawn and their intersection with the first two arcs precisely establishes **r** and **s**.



31
The geometrical structure of Allan Water showing the two nine-sided star polygons within the circle.



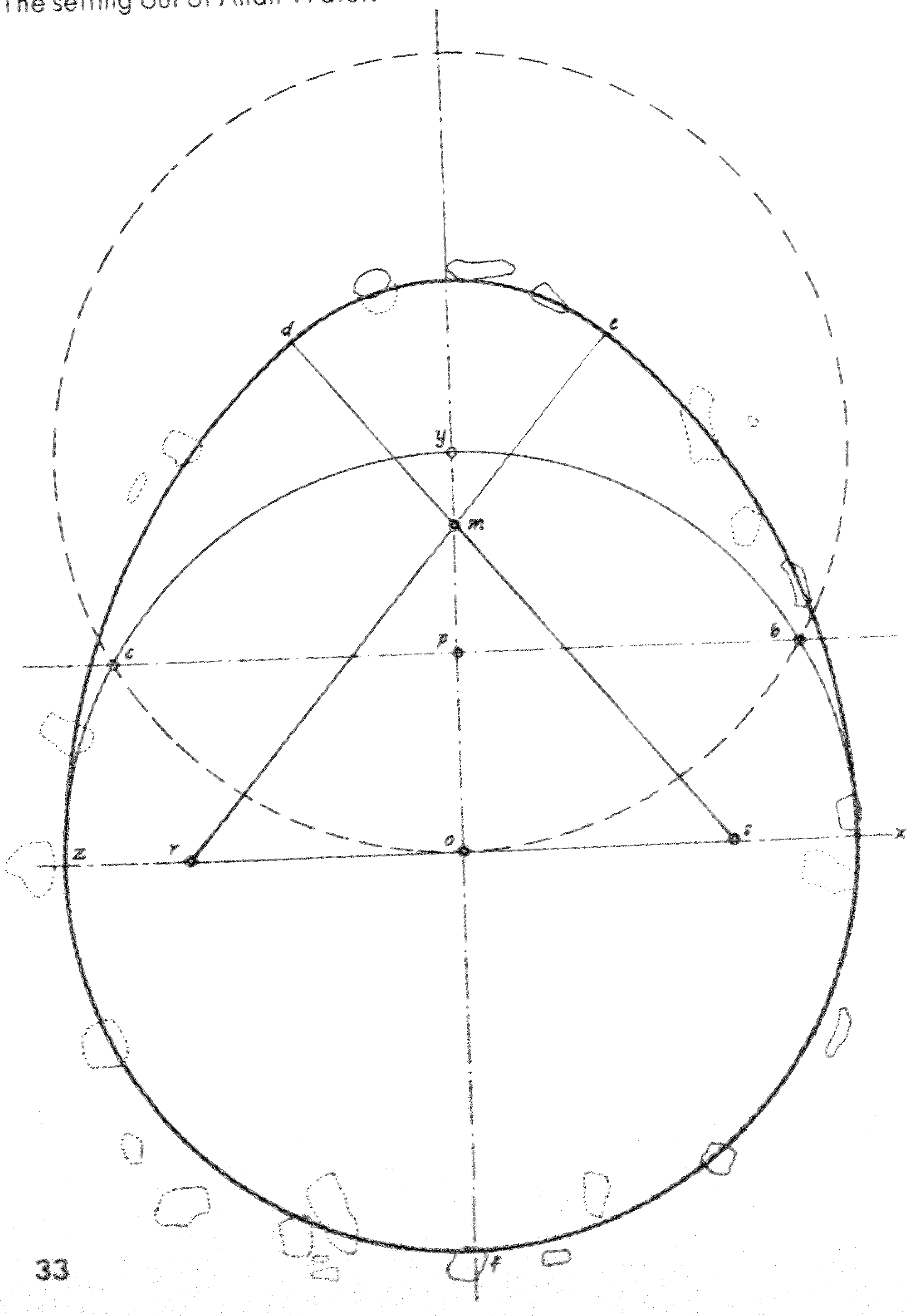
32
Schema of controlling geometry.

The four points **r**, **o**, **s** and **m** are those that Professor Thom proposes as the respective centres of the four arcs which constitutes the egg-shaped profile on whose perimeter the stones are placed. These points make up two mirror-image Pythagorean triangles (**mor** and **mos**) whose sides measure 8½ MY, 6½ MY and 5½ MY. Based on ½ MY units we have sides of 17, 13 and 11 units which, when put to the Pythagorean test, gives us 11^2+13^2 equals 290 and 17^2 equals 289. 'The discrepancy in the hypotenuse is only 1 in 580 and would hardly be appreciable' as Thom puts it.[22]

In order to draw the complete outline of the egg-shape (fig. 33) each centre determines a special segment of a circle to form a continuous outline. Firstly, the centre **o** and radius **ox** determines the bottom semi-circle. Secondly, the centres **r** and **s** and radius **re** and **sd** (13½ MY) determine the lateral curves from **x** to **e** and **z** to **d** respectively. Finally, with centre **m** and radius **me** an arc joins **d** to **e** to complete the outline.

We have already a completed circle from centre **o** (our primary circle) (fig. 34) and if we now complete the circle centred on **m** with radius **me** the arc of which – **de** – provided the final section of the Allan Water layout, we find that although the relationship between the larger and smaller circles is not the same as became obvious in the Borrowstone Rig geometry, a new significance emerges whereby the proportion of nine is established. The points **c**, **b** and **f** when joined, describe an equilateral triangle in the larger

33/34
The setting out of Allan Water.



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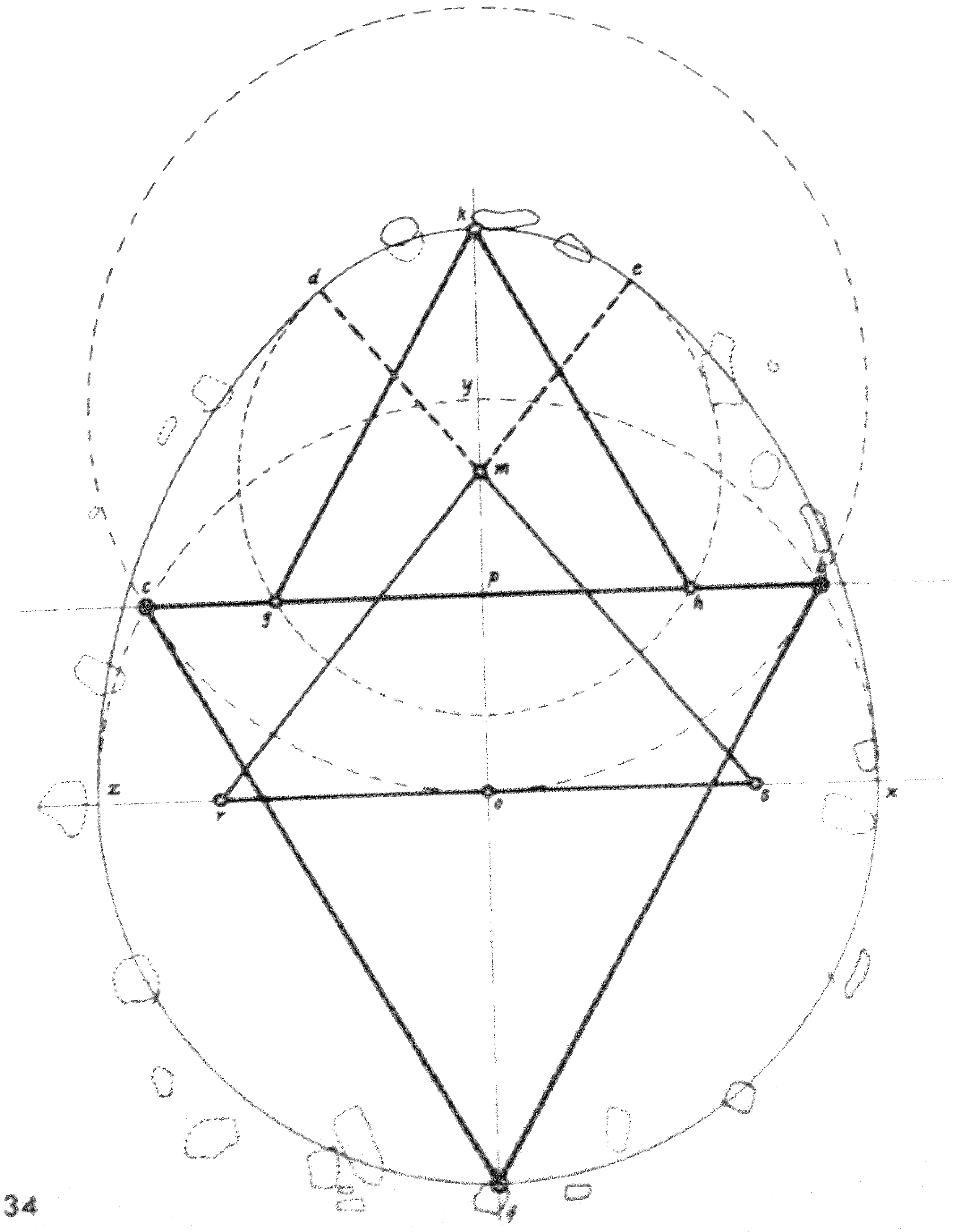


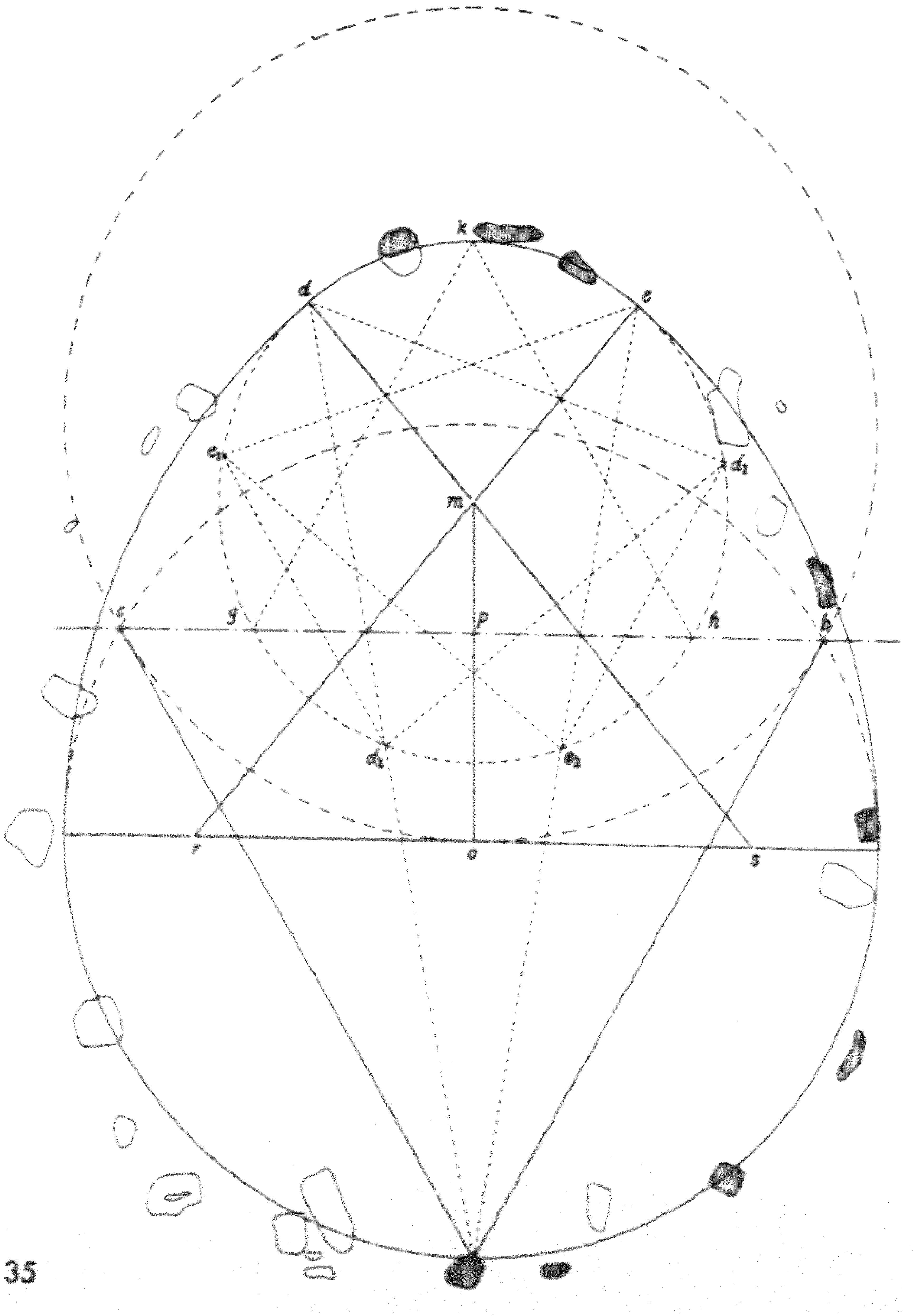
34

circle the top edge of which cuts across the upper smaller circle at **g** and **h**. The line (**gh**) also establishes the base of an equilateral triangle contained in the smaller circle (**ghk**).

If we take the sides of the right- and left-hand Pythagorean triangles (fig. 35) and extend their hypotenuse – from **s** through **m** and from **r** through **m** – until they cut the perimeter of the egg form, we find that these divide the perimeter of the smaller circle into two-ninths, sector **dke**. This means that from either **d** or **e** on this smaller circle two other equilateral triangles can be constructed **dd_1d_2** and **ee_1e_2** within the circle and these exactly cross over the first triangle based on the **bc** axis so as to make up a regular nine-pointed star. In our next illustration (fig. 36) the two nine-sided polygons are drawn which bound the nine-pointed stars with their primary equilateral triangles.

Once again we have a remarkable set of reconciliations between the whole numbers, the 'earthly' and measurable, (qualities represented by the Pythagorean triangles) and the transcendental ratios represented in this case by the ninefold polygon with its root three properties. We have no doubt that there are more subtleties, not only within this 'circle' but probably the vast majority of stone circles. They were certainly put together with a totally different attitude and knowledge from that which motivates the construction of a large building today.

35/36
The nine-fold nature of the setting out of Allan Water.



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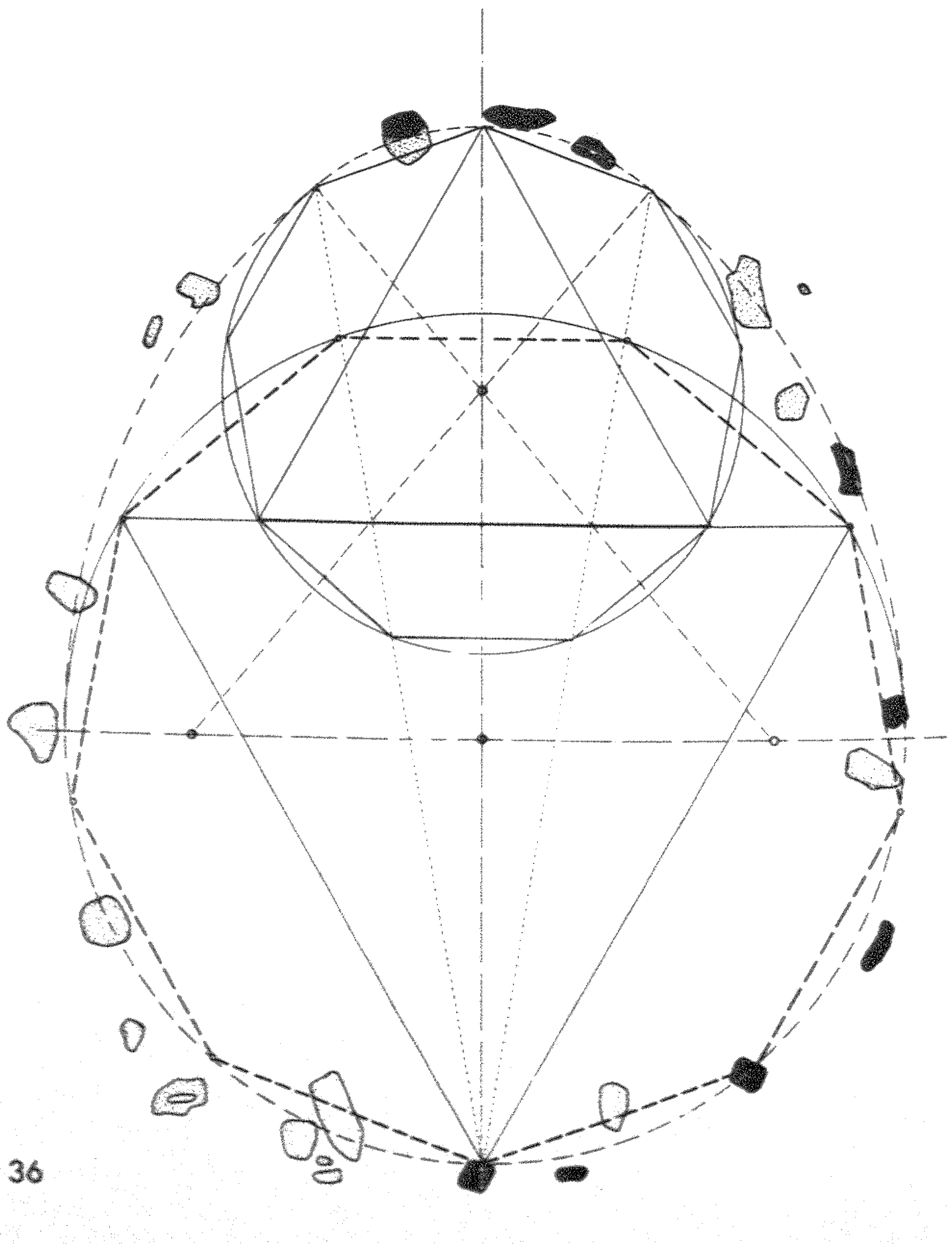

36

Chapter 3 **Significant Number**

> **'You see there is significance for everything, and these (numbers) are the things that are good for men to know, and to remember.'**
> *Black Elk*[1]

> **'All that has by nature with systematic method been arranged in the universe seems both in part and as a whole to have been determined and ordered in accordance with number, by the forethought and the mind of him that created all things.'**
> *Nichomachus of Gerasa*[2]

> **'Every diagram, system of numbers, every scheme of harmony, every law of the movement of the stars, ought to appear one to him who studies rightly.'**
> *Plato*[3]

3.1 Ancient Shamanism and Northern Mythology

Shamanism has been described as a surviving form of an archaic religion. It has been studied as far afield as Siberia, North and South America, Indonesia and the Pacific Islands. Religious techniques, common to shamanism, survive in Tibetan Buddhism, Tantrism and certain aspects of Islam. Eliade's monumental work, *Shamanism: Archaic Techniques of Ecstasy*, has placed shamanism among the acceptable subjects of comparative religion. When Western scholars were first confronted by the ecstatic technique of shamans they found it quite illogical and could therefore classify it only as a form of 'primitive' madness. However difficult analysis and understanding of the techniques of shamanistic ecstasy are, and were, for Western observers, what does stand out as strictly determined is the fundamental structure of their cosmology: particularly in the numbers of 'heavens' which are given as seven or nine according to perspective and circumstance. In this chapter our investigations will be focussed on these two particular numbers as both are revealed in the mythological structure, not only of shamanism but of the sagas of the Celtic races, who latterly inhabited the areas of the stone circles.

Elémire Zolla, Professor of Philology at the University of Genoa, puts forward a personal conviction that language carries its own archaeology in its etymological roots. In a recent publication he suggests a common structural cosmogony for all Indo-European languages:

> 'by the use we make of Indo-European roots, we affirm implicitly the cosmological process which is described in the Vedic Scriptures. Every root that gives birth to words meaning "Oneness" will also give birth to the *nine* following layers of meaning representing the nine stages of manifestation.'[4]

It is important to remember that these 'stages' of manifestation are part of an 'ever present' structure of creation that both the shaman or mystic are concerned with attuning to – an integrative understanding of the physical world is the end result of the process.

The *worldly* nature of the shaman among the Papago Indians has been strongly commented on by Underhill who was working with them up to 1935. The shaman, she said, paid for his eminence with the constant threat to his life. At the risk of lynching he must know in advance the correct outcome of war and the local games as, if he failed, he had no equivocation ready. Only the bold, astute and exceptional could survive by the accuracy of their visions and the effectiveness of their information. Sorcery was absolutely forbidden and a shaman's family could be killed if it were proved that he was using this. His role was one of diviner and prophet.

The central anchor of shamanistic cosmology is the symbol of unity exemplified by the unmoving Pole Star, so vital, according to Thom, for the orientation of the northern British circles. This star established the unitary axis of the cosmos and has various denominations depending on region. The Konyak and the Chukchee call it the Nail Star, the Samoyed call it the Sky Nail, and similar imagery is found among the Lapps, Finns and Estonians. Further south and east the image of a pillar becomes connected with the star: the Golden Pillar of the Mongols; the Iron Pillar of the Kirgis, the Bashkir and the Siberian Tartars; the Solar Pillar of the Teleut, and so on. It seems certain that there is a direct symbolic reflection of the 'World Pillar' (to which all the other stars are 'tethered like a herd of horses') in the central stake used as a gnomon for geometric and astronomic orientation in the layout of the stone circles.

In the domestic dwellings (or yurt) of certain of these peoples the sacred pillar is replaced by the hole in the apex of the roof through which the smoke escapes. The Ostyak for example speak of the 'golden flues of the Sky House', and the 'seven flues of the Sky God', and it is through these 'flues' that the shaman in this case passes from one cosmic zone to another. Thus from here is obtained the significant number of heavenly divisions on the vertical axis. It is this transcendence up the vertical axis which links the cosmology of the shamans and the great Celtic sagas.

In the ancient Irish sagas the paradisic world on the ontological axis is variously called the 'land of the young' or 'the delightful plain'. It was visited occasionally by mortals whose trips were referred to as echtrai (adventures) or baili (vision ecstasies). Their destination was the 'land of promise' or the world of the source of supernatural knowledge. One significant saga is that of the God Midir of Bri Leith which links the gods of the Sid-Mounds (the barrows) with the gods of rebirth. It tells of the claims of Midir on Etain, his wife in a former existence, who was separated from him by the magic of a

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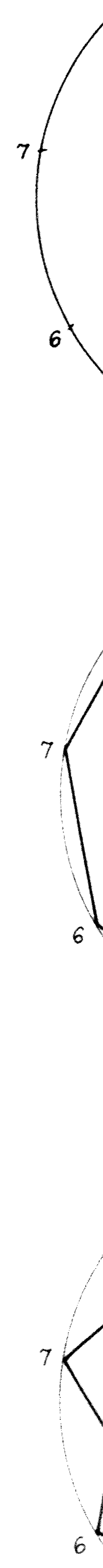
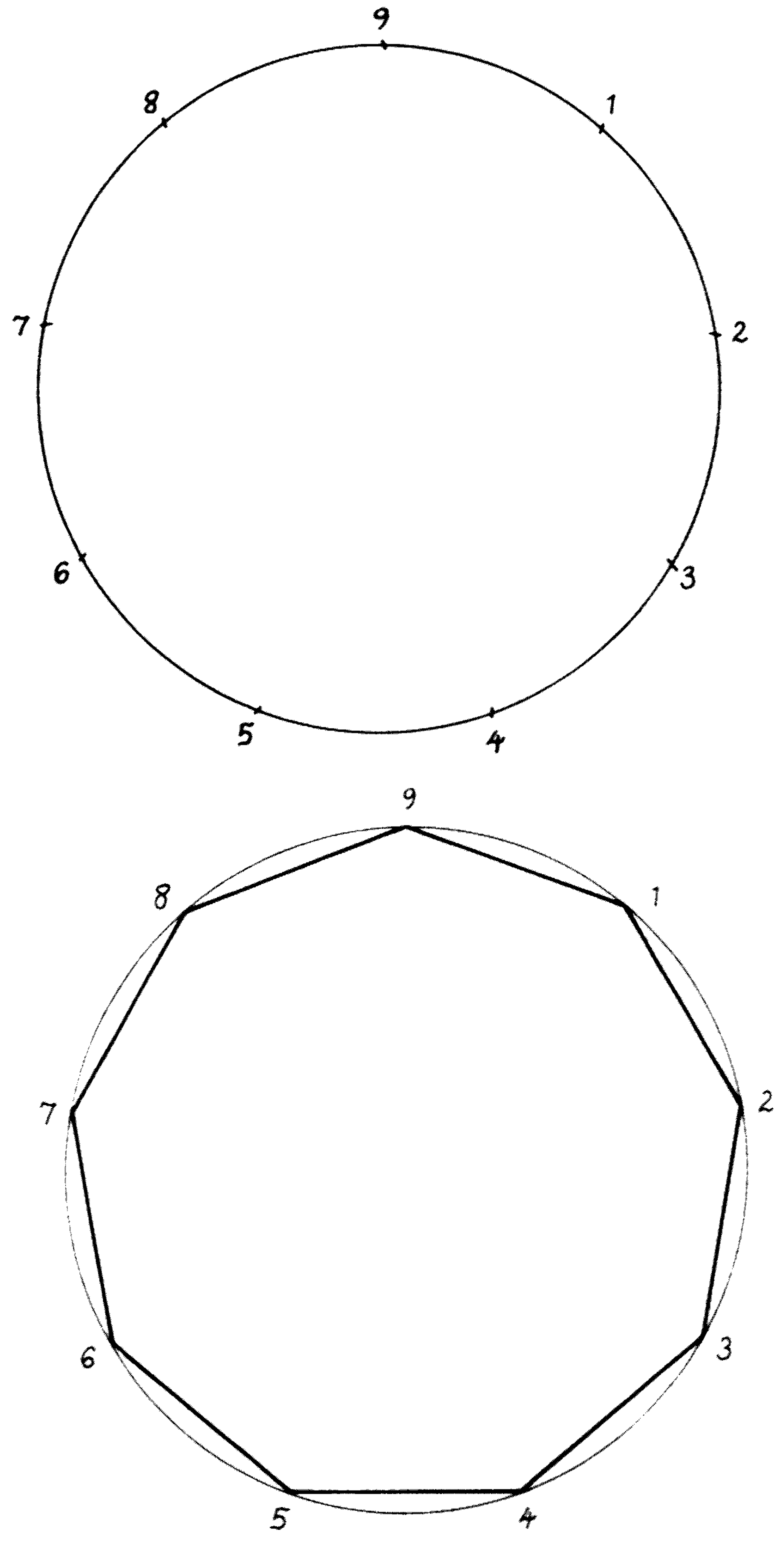


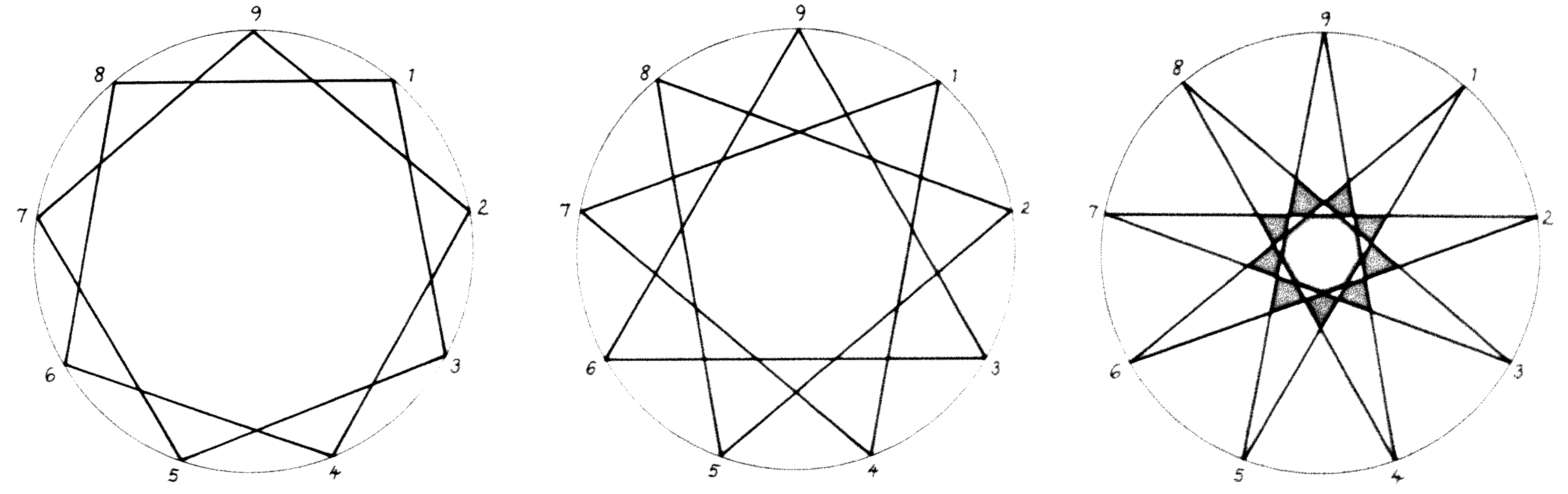


37a–e
The four ways of joining nine points equally distributed on a circle.

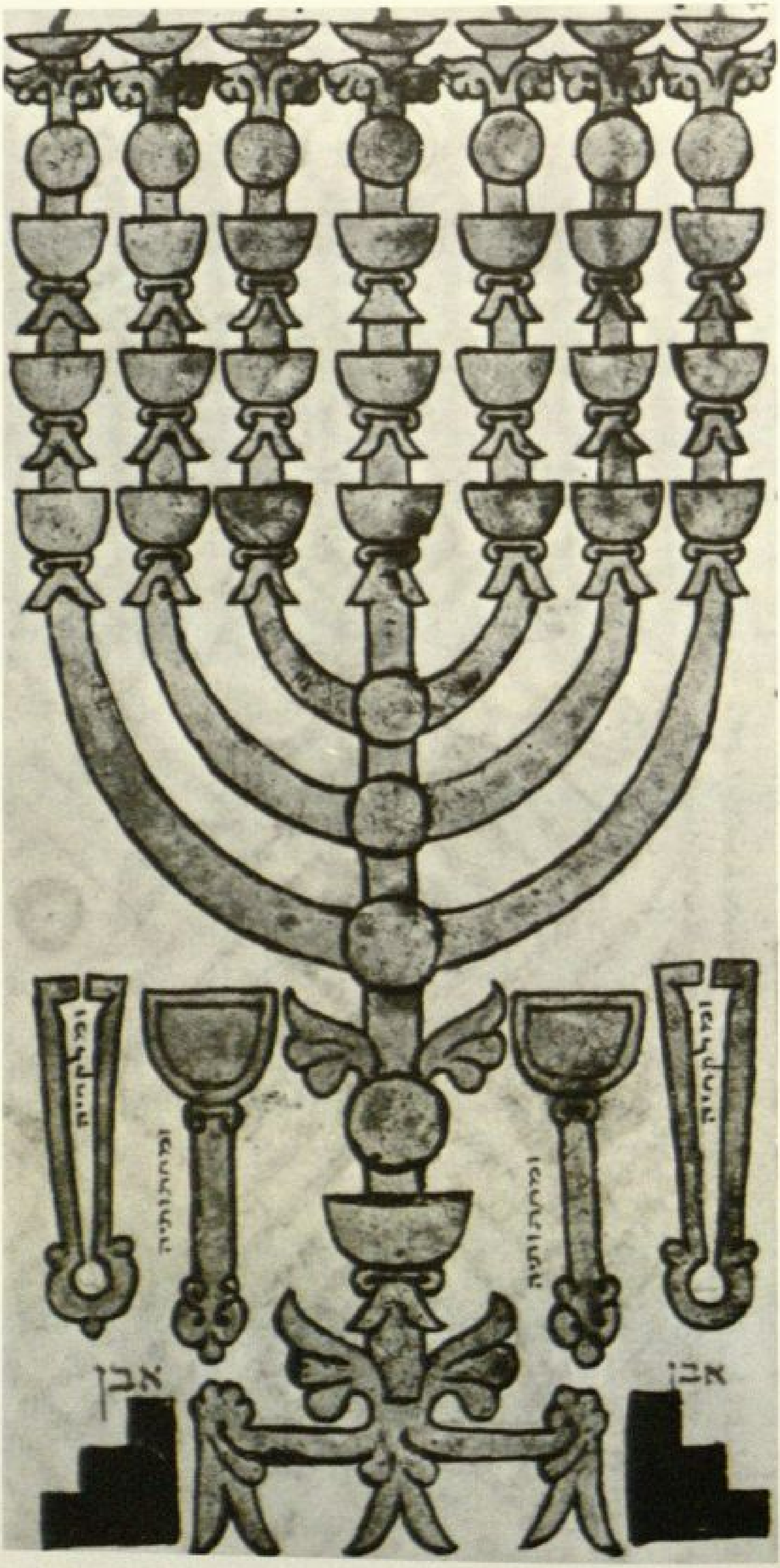
jealous rival. Etain then married Eochaid, King of Tara and Midir schemed to reclaim her. Eochaid accepted Midir's challenge to play two games of chess; Midir won the second game and came to claim Etain, his prize, at a feast at the court of King Eochaid. The entrances to the 'hall' were all barred, whereupon Midir miraculously appeared in their midst in great supernatural beauty and carried Etain off through the smoke hole in the roof.

The number of heavens, or transcendental planes, that the shamans experienced when their souls travelled up the vertical, ontological axis becomes particularly significant when one imagines what graphic symbols would be appropriate to signify these heavenly realms in 'our' world. As we have stated, the two most recurrent and significant numbers in shamanistic cosmology are seven and nine. In the language of geometry (geo-metry as earth-measure) these 'dimensions' of heaven may be represented in simultaneous form by a seven-sided shape or nine-sided shape within a circle; thereby the 'dimensions' of the transcendental world are expressed in concentric rather than serial form.

To explore this phenomenon of polygons within circles and the associated stars we can start with the pure circle and cut off nine equal intervals – a construction we have already covered (see fig. 37a–e). To make the polygon or nine-sided shape we simply connect up the points one by one or we can trace one of the following patterns. We can make a linear path around the nine points by missing every other point and travelling in the following sequence: 9, 2, 4, 6, 8, 1, 3, 5, 7 and back to 9. This results in a 'blunt' nine-pointed star. If we miss two points in the sequence we do not get a continuous flow, but rather three intersecting equilateral triangles. The fourth version becomes the most interesting because it contains all the other versions within itself. This star is created by following the sequence: 9, 4, 8, 3, 7, 2, 6, 1, 5, 9.



The development and application of the geometry of seven and nine in the breastplates of the Bush and Clandon Barrows in southern England will be demonstrated later (see Chapter 6). Here further examples of the numbers themselves will be discussed. Some of these examples are as far apart, both ethnically and seemingly culturally, as the Ngadju Dyak of South Borneo and the Ostyak and Lapp shamans of the far north. For instance Eliade believes



ומלקחיה
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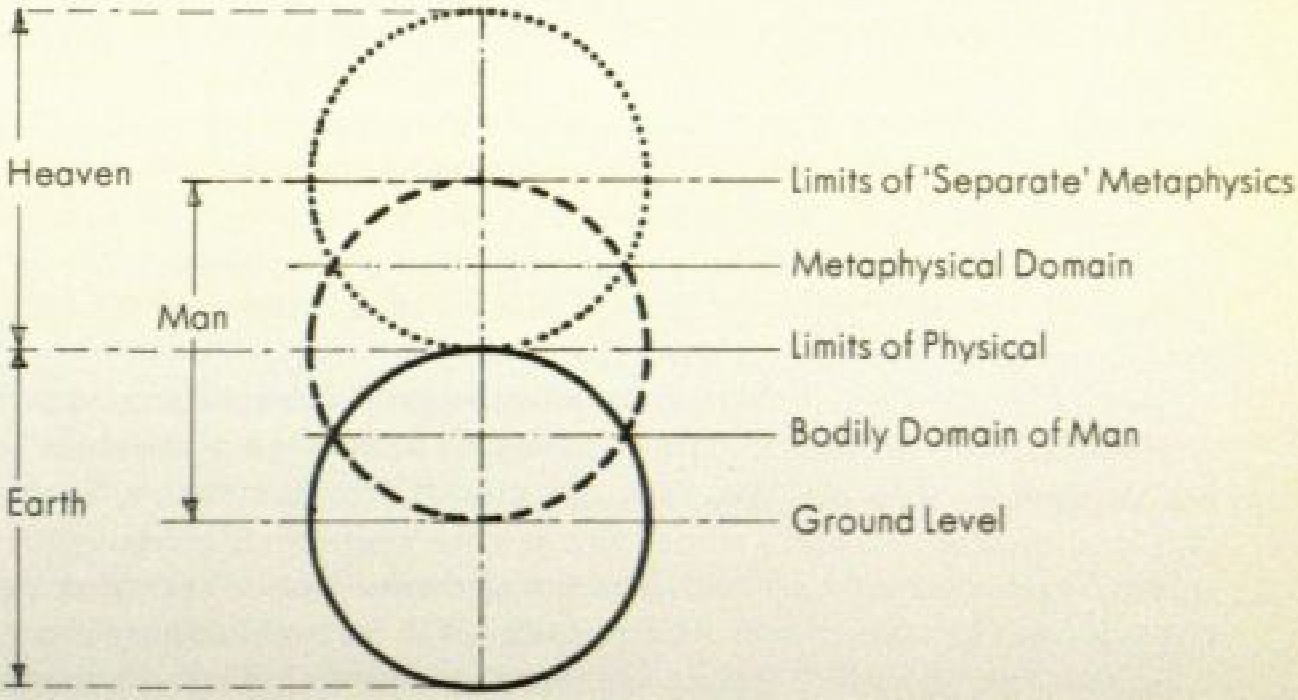
that the semitic seven-branched Cosmic Tree can be identified with the seven planetary heavens and may be due to influences originating in Mesopotamia. But he does not think this in any way implies an oriental transfer of the ideas to the Siberian shamans, as the axial ascent up the world 'tree' or pillar is a universal and archetypal idea.

The Altaic shaman uses a post with seven or nine notches (tapty) to represent the celestial levels. There are obstacles (pudak) to be overcome at the entrances to the respective heavens. Similar symbolism is found amongst the Yakut and Sibo who journey ecstatically through seven or nine celestial regions. The Ostyak's Cosmic Pillar has seven notches which we believe could reflect the archaic genesis of all notched measuring rods*.

It is also a common recurrence to find the reflection of the number of heavens above with the underworlds below in most north and central Asian peoples. For the Altaic shaman the problems of passing through the obstacles of the underworld were similar to those of traversing the seven consecutive obstacles of the heavenly world. Eliade also draws attention to the occurrence of these numbers in Oceana for the celestial regions. Although he puts their dissemination down to archaic shamanistic influence, he also believes that they cannot now be separated from Indian (Buddhist and Hindu) influences that have since been superimposed. This connection with Buddhism and Hinduism reminds us of their three primary realms: Heaven, Earth and Man. Eliade states his conviction that three times the primary three is the basis of the nine realms[5].

Returning to our graphic representation, if we draw a line from the centre of the heavenly circle to the centre of the earthly circle, we have represented the ontological axis or the pole of ascent. It can be seen that the three becomes nine if each realm is described in terms of its relation to each other: earth relates to itself, mankind and heaven, its source; mankind takes the central role of linking heaven, the source and archetypal world, to both itself and the earth; heaven is self-sufficient but also relates to its two major creations, mankind and the earth. Hence the three are essentially nine, by reflection.



As another way of accounting further significance of nine, Rhys has suggested it be related to the ancient Aryan eight-day week, which was arrived at by the northern convention of counting nine nights each side of the eight days.[6] A further expression of this in mythological terms was the eight rings that dropped from Odin's ring every ninth night, as also that Odin rode an eight-footed steed.[7] The battle between warmth and cold plays an understandably large part in the Eddic mythology; this also relates it to the universal fertility cycle which underlies all mythologies to a great extent—as it is the rhythm of life itself. In the *Thrymskvitha* legend one version has Niord, patron of the sea and consort of Skaldi, goddess of snow-skates, singing:

> I love not the mountains, I dwell not long in them.Nine nights only;
> Sweeter to me is the song of the swan than the wild wolf's howl.[8]

Skaldi replies to this song that she is disturbed by the screaming of the sea birds.

Their marriage represented the relationship between the three summer months of the life of the flowing waters of the sea and nine winter months of gestation of the snow maiden Skaldi. Here the Nordic experience was a direct parallel between the gestation of vegetative and human life and gives a basis for the division of the year into threes.

Odin, Thor and Frey, chief of the Nordic gods, and related to the three roots of the Yggdrasil or sacred tree—the northern version of the ontological axis linking centrally the three cosmic regions—affirm the primordality of three and its natural reflection in three times three or nine.[9] This is brought out in another context in the Eddic poem the *Havamal*. Here the God Odin is represented in a form of crucifixion—or spirit impaled in matter—one way of demonstrating, in a mythological structure, the ultimate 'imprisoning' of being in the last stages of the cosmogonic structure.

> I know that I hung
> On the wind-stirred tree
> Nine nights long
> Wounded by spear
> Consecrated to Odin
> Myself to myself;
> On the mighty tree
> Of which no man knows
> Of which no man knows
> Out of what root it sprang.[10]

However in this story Odin also after great personal suffering managed to bring the knowledge of the runes back down to earth. As if to further emphasize this cosmic structure, we also learn that the roots of the Yggdrasil are in the nine worlds or 'dark hell' of *Niflhel*, the home of the dead. There are also records of a festival or fertility feast recurring every nine years, believed to be on the equinox and lasting nine days in Uppsala, according to Adam of Bremen.[11] This curious interweaving of cosmic rhythms and ontological states is further emphasized by the enforced delay in the marriage of Frey to Gerda by nine nights, and the nine giantesses on the edge of the sea and land who mothered Heindall, watchman of the Norse Gods.[12] Another example is found in the rhythmic battle between Thor and the sea serpent, when he takes nine paces in his march against his foe only to be 'slain' himself at the approach of each winter.

Returning to the Celts: the Irish are on record as having denoted a length of time by the term *nomaid* (or *nomad*) which because of its root *noi*, (nine) meant some sort of division into nine.[13] Possibly there is a connection with the Nordic nine-month and nine-night system. In the great Cuchullin saga, Conchobar sent out nine men to seek a wife for Cuchullin, and his house had nine compartments, an echo possibly of the divisons at the centre of the Bush Barrow template, a subject of detailed examination in a later chapter.

The following examples demonstrate the significance of nine for the Celtic peoples. In the *Vita Merlini* Merlin had nine bards and there were nine dragons.[14] Nine witches are mentioned in *Peredur*.[15] Beowulf slew nine *nicors*, and the Fortunate Isles were ruled over by nine sisters.[16] Perhaps they were feminine relatives of Skaldi, the snow-skates consort of Odin? Could they also be related to the wonderful cauldron of the Head of Hades, kept boiling by the breath of nine maidens?[17] Uther Pendragon claims 'a ninth part in the prowess of Arthur' in the Book of Taliessin.[18] In the 'Kulhwch and Olwen' Kei could exist nine nights and nine days without sleep, and Bedwyr's spear made nine wounds as it was withdrawn.

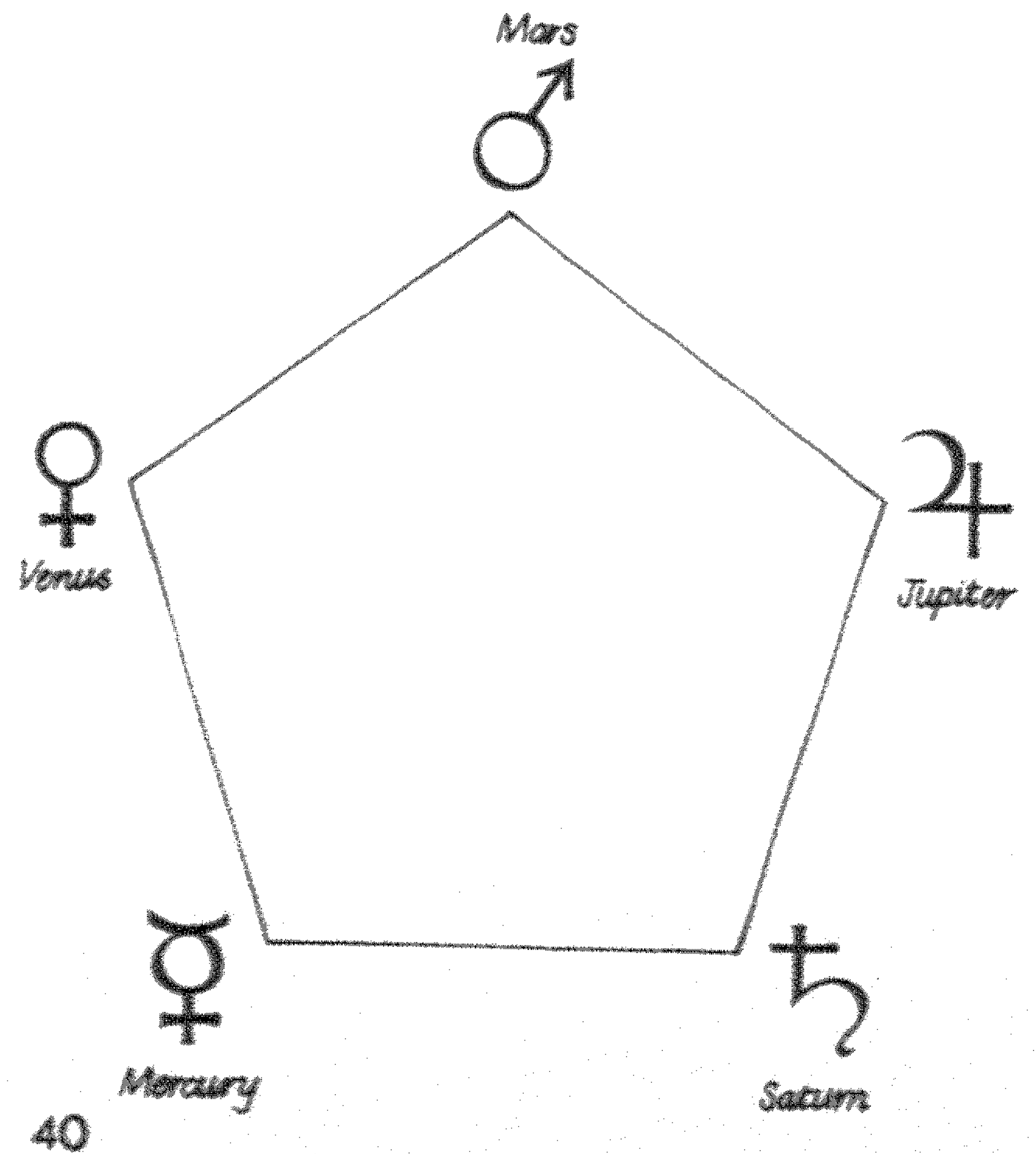
Myths and sagas in the oral tradition embody a total cosmology – an integration of psychology, number and cosmic rhythms. The original form of transmission of these sagas was the spoken word, as in the great tales of Homer. The mistake that has been made for too long now is to necessarily equate an alphabet and a recorded numerical system with the ability for abstract thought. Maybe our own inability for the 'gestalt' experience is an inverse reflection of an earlier phase of mankind, who refused to break up the totality of experience by the replacement mechanism of an abstract sign language and preferred the oral and craft tradition for transmitting wisdom. We have the remarkable testament of Julius Caesar who described the threefold nature of the 'Gaulish' society: Plebs (the husbandmen), Equates (the warriors), and Druides (the philosopher-priests). Of the latter he elaborates: 'It is said that they commit to memory immense amounts of poetry and some of them continue their studies for twenty years. They consider it improper to commit their studies to writing, although they used the Greek alphabet for almost everything else. They have also much knowledge of the stars and their motion, of the size of the world and of the earth, of natural philosophy, and of the powers and spheres of action of the immortal gods, which they discuss and hand down to their young students.'[19]

Myles Dillon and Nora Chadwick, the contemporary Celtic authorities, like Professor Zolla of Genoa, say that they are overwhelmed by the evidence linking the Celtic and ancient Indian Vedic civilizations. Speaking of the ancient Irish philosophers, known as the filid, who maintained a similar oral tradition, they say that 'both the form and content of their learning shows astonishing similarity to brahmical society'.[20] They go on to assume a link between filid, druid and brahmin inherited from a common tradition, which serves to reinforce the theory that there may have been an extensive archaic Indo-European culture.

There is also evidence that the druid oral tradition was taught in triads, that is in short poems with a content of three elements. In the case of the ancient Welsh triads the letters of the alphabet were themselves composed of three basic elements. A similar parallel can be seen in ancient China: when Confucianism became the state philosophy a certain scholar, Wang Ying-Lin, (1223–96) was reputed to have committed to writing a previously ancient oral tradition in the form of *The Three Character Classic* (San Tsu Ching).[21] Two relevant examples of these Chinese triads are numbers 13 and 14: 'Three mighty powers; Heaven, Earth and Man', 'Three great lights; Sun, Moon and Stars'; the first of which has become known as the Far Eastern Triad.

Chadwick and Dillon believe that the same Celtic peoples inhabited the British islands up to two thousand years before the arrival of the Romans. What is certain is that Caesar records the Druides as having 'much knowledge of the stars and their motion'. Whether the Celts are the actual descendants of the circle builders is not so important as that they most probably inherited the astronomical and philosophical wisdom of their predecessors. To have 'much knowledge of the stars' one needs to have a technique for applying, measuring and checking such knowledge. Caesar's report would imply that they certainly inherited the knowledge of how to use the stone circles even if they were not the originators. He also tells us that the Gauls worshipped Mercury, Apollo, Mars, Jupiter and Minerva – five named deities which have upset scholars because he gave no Gaulish names. Maybe Caesar felt it obvious that they referred to the planets as their embodiment and saw no need to elaborate further.

It is these five planets together with the Sun and Moon which make up the most primordial cosmic set of seven. There is a tradition that makes up the complement of nine by including the Earth (the sublunar sphere) at the centre surrounded by the Moon, Mercury, Venus, the Sun, Mars, Jupiter, Saturn and finally the sphere of the fixed stars or zodiacal belt.



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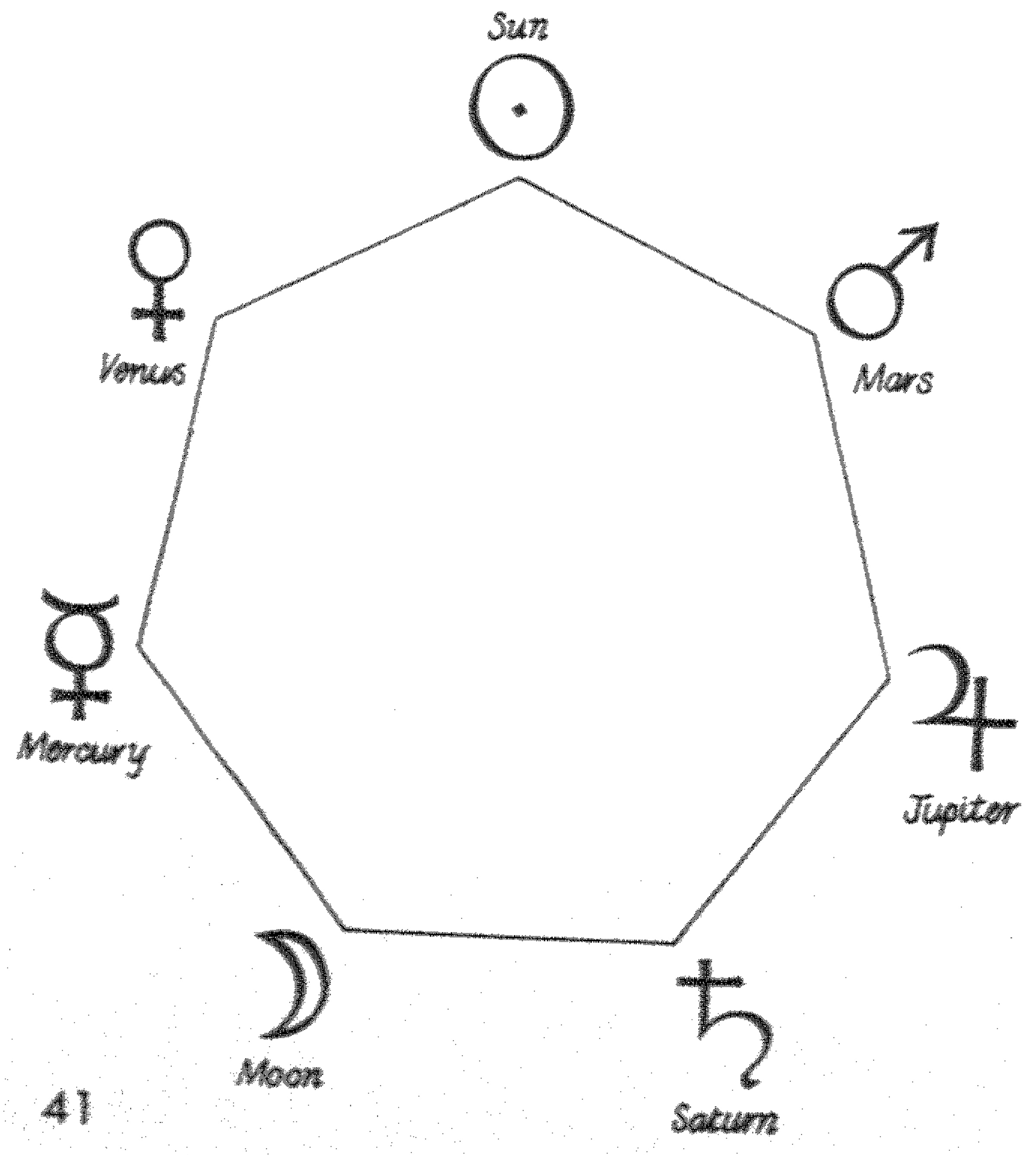
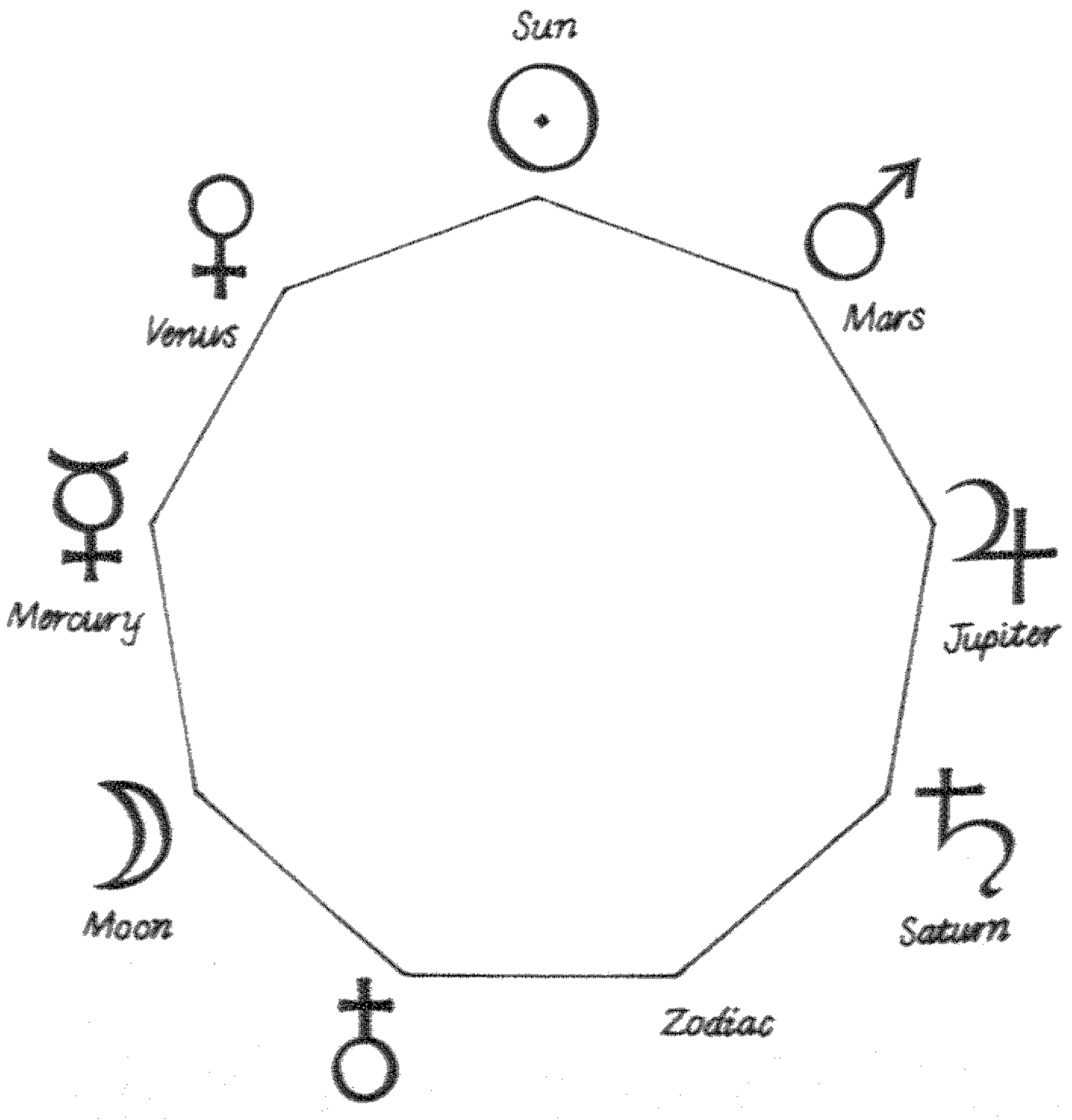
40
The five planets.



41

41
The seven 'wanderers'.



42

42
The seven 'wanderers', the central earth and the background constellations, making nine.

3.2 Number as Pattern

Having demonstrated the importance of nine and seven in the mythological and cosmological structures of the northern peoples, both Celts and Norsemen, we will now turn to parallels in other traditions and examine the doctrine of archetypes implied.

A certain group of Islamic scholars, professionals, artisans and philosophers, formed themselves into brotherhood under the name of the *Ikhwān al-Ṣafā*, the Brotherhood of Purity. Their aim was to collate all relevant knowledge available to them and to publish it for all to read. In their own words:

> 'Our purpose embraces of necessity all that which permits man to ameliorate his life on earth and to assure his happiness and salvation in the eternal world.'

In their work, the *Rasā-il*, they demonstrate their belief in the archetypal and even supra-human content of astronomy, the science being revealed to the prophet Idris (Hermes Trismegistus) who, significantly, 'journeyed to Saturn' (Chronos) in order to be instructed and returned to earth to relate the basis of the science of the heavens. This latter in its own way reflects the journey of Odin to obtain the knowledge of the runes.

In the Islamic perspective, after the seven spheres which are, when counted out from Earth as the centre, Moon, Mercury, Venus, Sun, Mars, Jupiter and Saturn, there is the 'heaven' of the fixed stars or zodiacal belt which is sometimes equated with the *kursi* (pedestal of God). The ninth 'heaven' is the *'arsh* (throne) thus conforming to Quranic terminology. Thus the footstool and the throne of God make up the seven heavens of the Quran into the full nine. After describing the earth-centred scheme of natural perception, the *Ikhwān* gives an important clue to the double meaning hidden in traditional wisdom:

> 'God has placed the sun at the centre of the universe just as the capital of a country is placed in its middle and ruler's palace at the centre of the city.

This means the solar sphere is the centre of the nine with four below and four above, also suggesting an esoteric knowledge of the heliocentric mechanics of the solar system.

Like the Pythagoreans, the Brotherhood of Purity held particular numbers to have cosmological significance both for their individual qualitative value and their cosmic structural aspect. These were, in particular, the numbers seven, nine, twelve and twenty-eight, all of which have the common value of being composites of the archetypes three and four. Professor Zolla points out that 'unity is always inherently threefold: itself, itself as identical to itself and itself as the standard of identity'.[22] Three has primacy after the fundamental principle of one (unity) in the *Ikhwān* system because it represents the essential tendencies inherent in the universal spirit (*al-Rūh*): this is expressed in triangular form as the descending movement away from the first principle, the horizontal expansion and finally the returning ascent back to the first principle. (We can recognize here a flowing version of the three realms of the Far Eastern triad: Heaven as donating; the Earth as receiving and expanding horizontally; Man representing the re-unifying spiritual ascent.) Four was cardinal for it represented the polarization of universal nature into the active qualities of heat and cold and the passive qualities of moisture and dryness. These qualities were also associated with the fourness of the solar system in terms of the winter and summer solstices, the longest night and longest day respectively, and the equinoxes of spring and autumn when day and night are of equal length, as we have noted earlier.

Thus seven, nine, twelve and twenty-eight correspond archetypically and numerically with the planets, the spheres or heavens, the zodiacal constellations and the lunar mansions. We find a similarity to the Islamic tradition in the description by Black Elk of the Sun Dance Lodge:

> 'I should explain to you here that in setting up the sun dance lodge, we are really making the Universe in a likeness; for, you see, each of the posts around the lodge represents some particular object of creation, so that the whole circle is the entire creation, and the one tree at the centre, upon which the twenty-eight poles rest, is *Wakan Tanka*, who is the centre of everything. Everything comes from Him, and sooner or later everything returns to Him. And I should tell you why it is that we use twenty-eight poles. I have already explained why the numbers four and seven are sacred; then if you add four sevens you get twenty-eight. Also the moon lives twenty-eight days, and this is our month; each of these days of the month represents something sacred to us.'[23]

The Ikhwān viewpoint is expressed as follows:

> 'The Pythagoreans who think that beings correspond to the nature and properties of numbers know also the perfection of Divine Wisdom which is its origin. In fact the numbers 7, 9, 12 and 28 are the first numbers which are called complete (*Kāmil*), odd, square, exceeding and perfect respectively. Also the cause of the exclusivity of those numbers comes on the one hand from the fact that $7 = 3 + 4$; $12 = 3 \times 4$; $28 = 7 \times 4$ and on the other hand $7 + 12 + 9 = 28$. Thus noble beings correspond to noble numbers.'*

*In addition to the $7 + 12 + 9 = 28$ another correspondence to the archetype of seven is that $28 = 1 + 2 + 3 + 4 + 5 + 6 + 7$.

Frithjof Schuon, the contemporary Islamic scholar, describes the intimate connection between qualitative number and geometrical figures as follows:

> 'This is numbers in the Pythagorean sense, of which the universal rather than the quantitative import is already to be divined in geometrical figures; the triangle and the square are "personalities" and not quantities, they are essentials and not accidentals. Whilst one obtains ordinary

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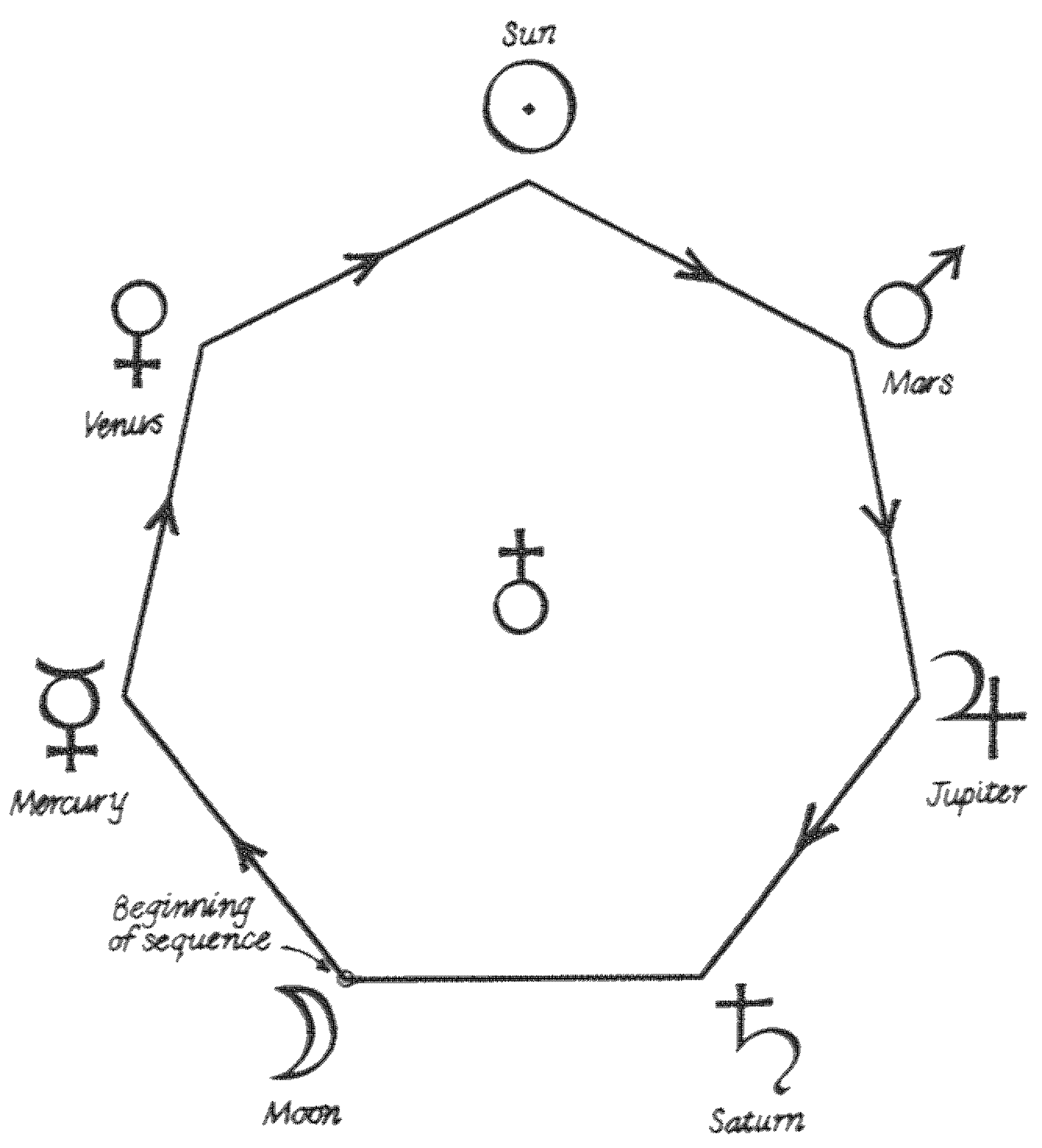
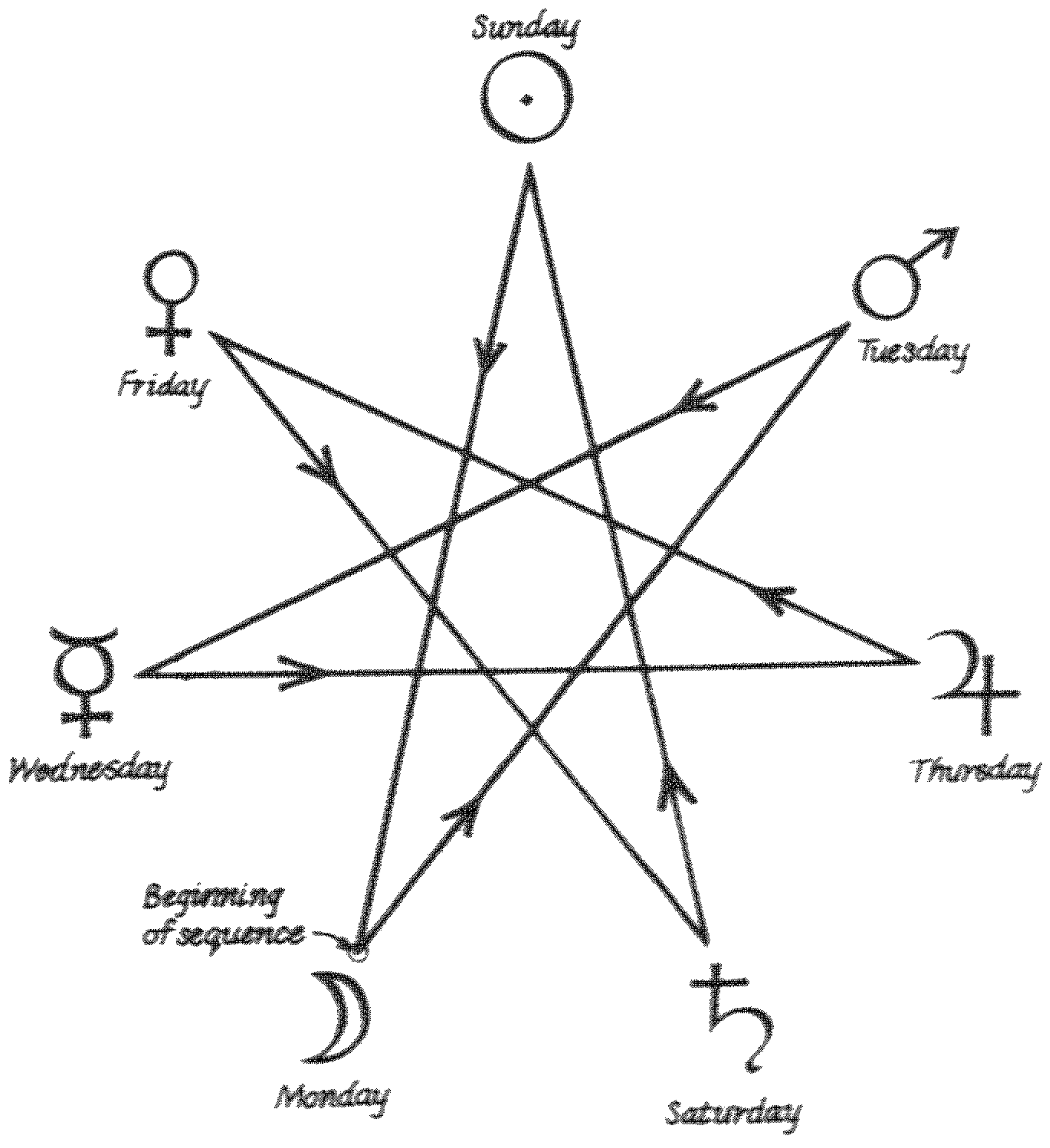
S. H. Nasr, *An Introduction to Islamic Cosmological Doctrines* (London, 1979), p. 78.

43
The geocentric planetary sequence.



44
The days of the week and their related heptagon.



> numbers by addition, qualitative number results, on the contrary, from an internal or intrinsic differentiation of principial unity; it is not added to anything and does not depart from unity. Geometrical figures are so many images of unity; they exclude one another or rather, they denote different principial quantities; the triangle is harmony, the square stability; these are "concentric" not "serial" numbers.'[24]

To expand this theme we will take one such number which, by necessity, holds a special place in Babylonian, Egyptian, Hindu, as well as Christian, Moslem and Jewish cosmologies and religions: the number seven, already shown to be evident in the layouts of at least two of the British stone circles.

Taking a seven-sided polygon and the 'stars' within it we can place one each of the traditional set of visible planets on each of the points. We propose to take the particular arrangement communicated to us privately by Marcel Hinze as a result of his studies into ancient Egyptian knowledge and practices. By this method we place the Sun at the top followed on its right by Mars, then Jupiter, Saturn, the Moon, Mercury and Venus. By following this sequence from the bottom and proceeding clockwise we have the planets as they relate in distance from Earth: the Moon is nearest followed by Mercury, Venus, the Sun, Mars, Jupiter and Saturn. This is the perceptual or observational pattern and is quite irrespective of whether we take the Sun to be moving around us, as it is seen to do, or whether we interpret the pattern using our knowledge of the Sun as the centre of the system. In our illustration the difference in 'knowledge' about the mechanics of the solar system is shown. By taking the planets at their greatest distance from Earth we show how the sequence is identical in principle from either the geocentric or heliocentric viewpoint.

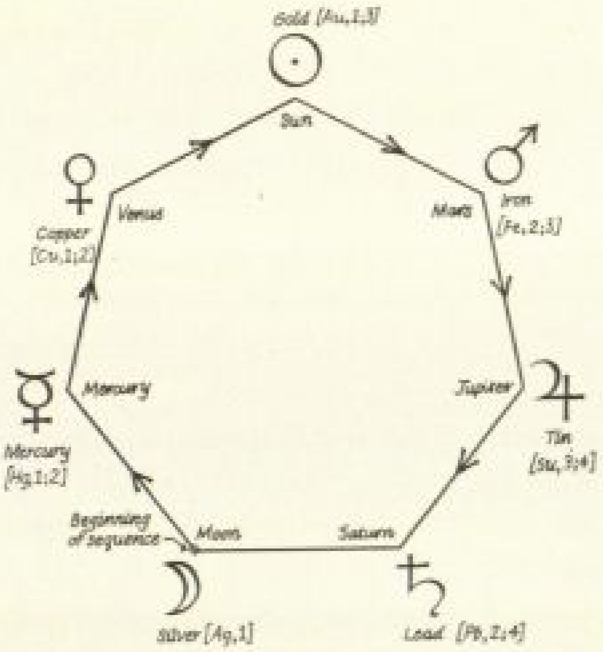
Having placed our 'planets' (strictly speaking the Sun is a star, hence placed at the top) around the heptagon we now have a chance to read the significance this arrangement is believed to have had for the ancients. There are three ways in which one can travel sequentially around the set of seven points. We take the most 'energetic' and longest route (or sharpest pointed star) by missing two adjacent positions and moving to every third point until we return to our starting-point. We find that we have drawn a sequence which follows the days of the week. If we start on Monday (Moonday–lundi in French, lunedi in Italian following *luna*) we travel up to Tuesday (old English Tiw's day, an ancient Germanic deity identified as Mars; *martedi* to the Italians and *mardi* in French). Next we cross to Wednesday (Wotansday, Wotan corresponding to Mercury; *mercredi* in the French, *mercoledi* in Italy). We now move straight across to Thursday (Thor's day. Like the Roman god of thunder, Jupiter or Jove, Thor was the northern god of thunder, *jeudi* for the French and *jovedi* for the Italians). The star path now proceeds up to Friday (Freya's day, the Nordic goddess who corresponds to the Roman Venus; we have *vendredi* and *venerdi* and *freitag* in Europe). From here we follow the path down to Saturday (Saturn's day) and finally up to finish on Sunday, the day of the Sun and day of rest for christendom.

Here we are on familiar ground and we have shown one kind of logic pattern behind the reason for allocating particular days to particular planets, a

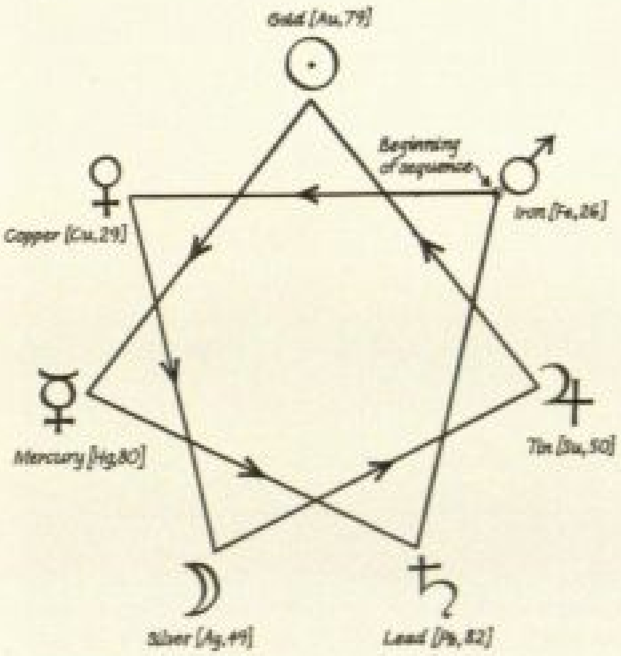
Night hours Day hours	☉ Sunday		☽ Monday		♂ Tuesday		☿ Wednesday		♃ Thursday		♀ Friday		♄ Saturday		
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	
First	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	1
Second	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	2
Third	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	3
Fourth	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	4
Fifth	♄	☿	☉	♃	☽	♀	♂	♄	♀	☉	♃	☽	♀	♂	5
Sixth	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	6
Seventh	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	7
Eighth	☉	♃	☽	☿	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	8
Ninth	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	9
Tenth	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	10
Eleventh	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	11
Twelfth	♄	☿	☉	♃	☽	♀	♂	♄	☿	☉	♃	☽	♀	♂	12

45
The 'Solomonic' calendar of hours.

sequence which is not obvious from the order that the planets appear in the sky. Hinze also pointed out the ancient Egyptian custom of allocating a planet to each *hour* of the day. In this case the first hour of the day of, say, Saturday would be governed by Saturn, the second hour by Jupiter, then following, Mars, the Sun, Venus, Mercury and so on recurrently continuing until the twenty-fourth hour of Saturday is reached which we find is governed by Mars. Therefore the *first* hour of Sunday is dominated by the Sun. If we continue this process we arrive at a situation where the first hour



46
The traditional allocation of metals to planets and the atomic valency sequence. There is a semi-anomaly between tin and lead.



47
The atomic number sequence of the metals associated with the seven wanderers.

of each day is dominated by the planet appropriate to that day. This pattern flows backwards, or anti-clockwise, around the perimeter of the heptagon.

Hinze, having discovered a pattern which demonstrated a logic to the planetary allocations for the days as well as the hours of each day, pointed out to us that the ancients divided the period between dawn and dusk into twelve hours irrespective of season. This meant the length and quality of an hour changed with the quality of the season and time of year. As there is no direct evidence of an earlier use of this seven-fold system, we suggest that there may well have been an earlier oral tradition based on observation which would give practical reasons for embodying the seven-fold patterns within the megalithic temples.

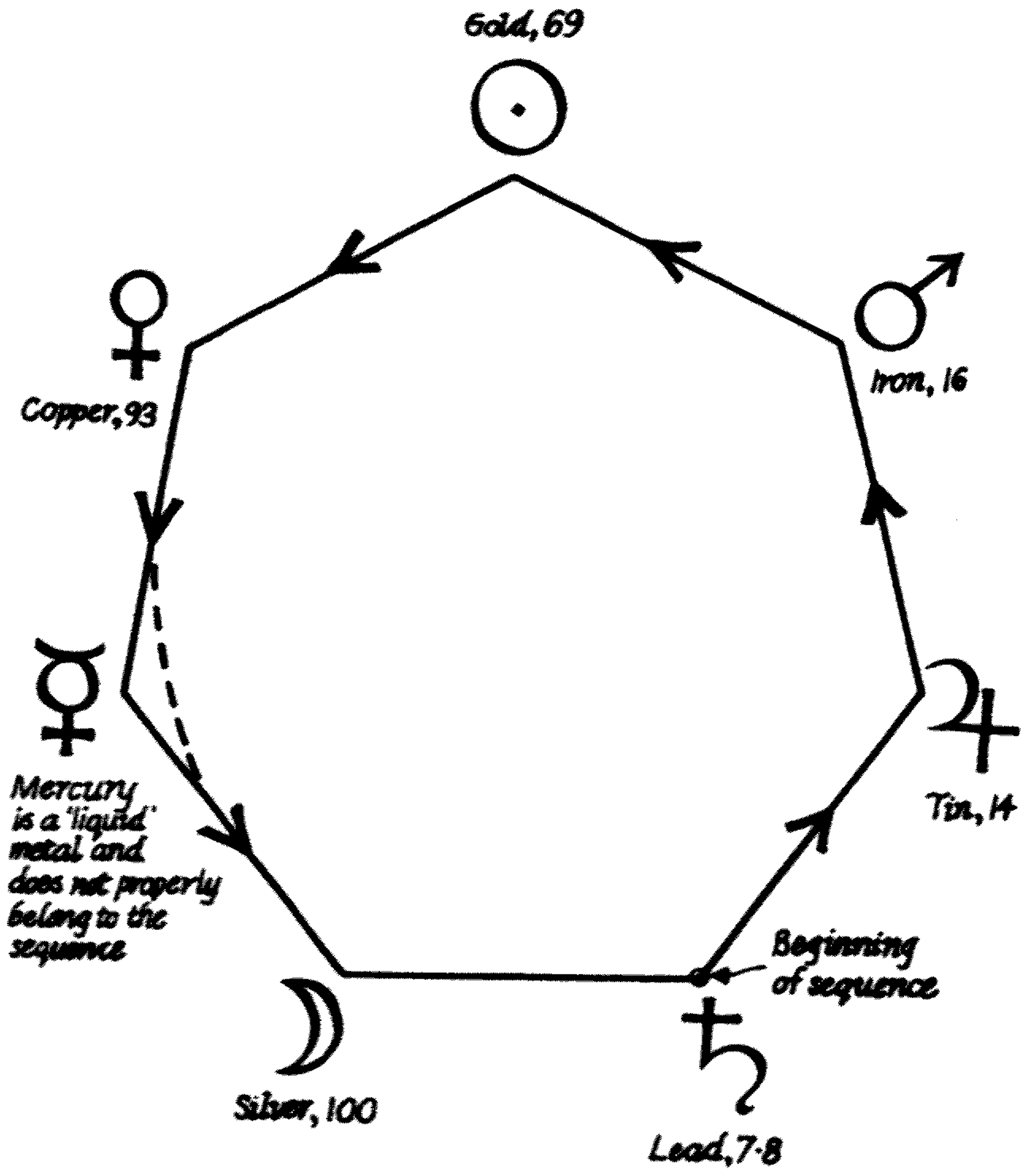
Although we have yet to touch on the later metal-working periods in British history, we find it relevant to extend our study of the seven-fold pattern to the ancient allocations of metals to the planets: this means in traditional terms that those archetypal principles which are represented in the planets macrocosmically are also represented in certain metals microcosmically. If we take the sequence that has arisen out of Hinze's studies and place the metals with their respective traditional planetary partners we get the following correspondences; silver – Moon, quicksilver – Mercury, copper – Venus, gold – Sun, iron – Mars, tin – Jupiter and lead – Saturn. Hinze, as a physicist, felt convinced there was more to this traditional allocation than fancy or mere colour correspondence. He investigated many possible aspects and properties that might reveal a pattern, until a remarkable correspondence arose from a totally unpredictable source of data: the periodic table of the elements. This modern convention of categorizing the naturally occurring substances according to their atomic number, which is equal to the number of protons in the nucleus, revealed an orderly sequence in the following way.

When the atomic numbers for the respective metals are placed on the heptagon, according to the planetary correspondence, we get the following sequences: in ascending order of atomic number we start with iron (Fe) which has an atomic number of 26, followed by copper (Cu) with 29, silver (Ag) with 49, tin (Sn) with 50, gold (Au) with 79, mercury (Hg) with 80 and finally lead (Pb) whose atomic number is 82. The rather startling result is that our path has constructed a further, different, seven-pointed star – on this occasion created by missing one interval per move.

Hinze was so delighted with this pattern he had chanced upon that he took it to his physics professor. The professor's reaction was to calculate the statistical number of chances of the pattern having registered in this way – the result is 5040-to-1 against the occurrence! It is difficult to know what to conclude from such a discovery. We should bear in mind however that the ancients had a different approach as well as different attitudes toward the attainment of knowledge from that of ourselves. Their techniques are far more likely to have been in tune with the tradition embodied in the Vedas, where knowledge is acquired through inner experience under the psychological discipline of one of the forms of Yoga.

Before leaving the strange symmetry of the heptagon and the patterns there is another sequence of interest which emerges from atomic valency-characteristics of the metals; that is, their propensity to link with other atoms. Starting with silver, which is univalent and placing the elements in order of increasing 'jointing' potential, we have quicksilver (mercury) and copper, both of which are uni- and bivalent, followed by gold which is uni- and trivalent, iron which is bi- and trivalent, tin which is tri- and quartovalent and finally lead which is bi- and quartovalent. Here again we have only one 'semi-anomaly' among the seven, that is the relation between tin and lead. Otherwise the correspondence follows exactly as the 'planetary' sequence which we laid out to begin with.

One more observation on the metal patterns is the electrical conductivity of each. This produces a pattern which moves around the heptagon in the reverse way starting with lead, at 7.8, to tin, 14, to iron 16, to gold 69, to copper 93, (mercury as a 'liquid' metal cannot correctly be included) and we finish at silver with a conductivity value of 100. We are grateful to Wilhelm Pelikan for the data of these last two patterns.[25]



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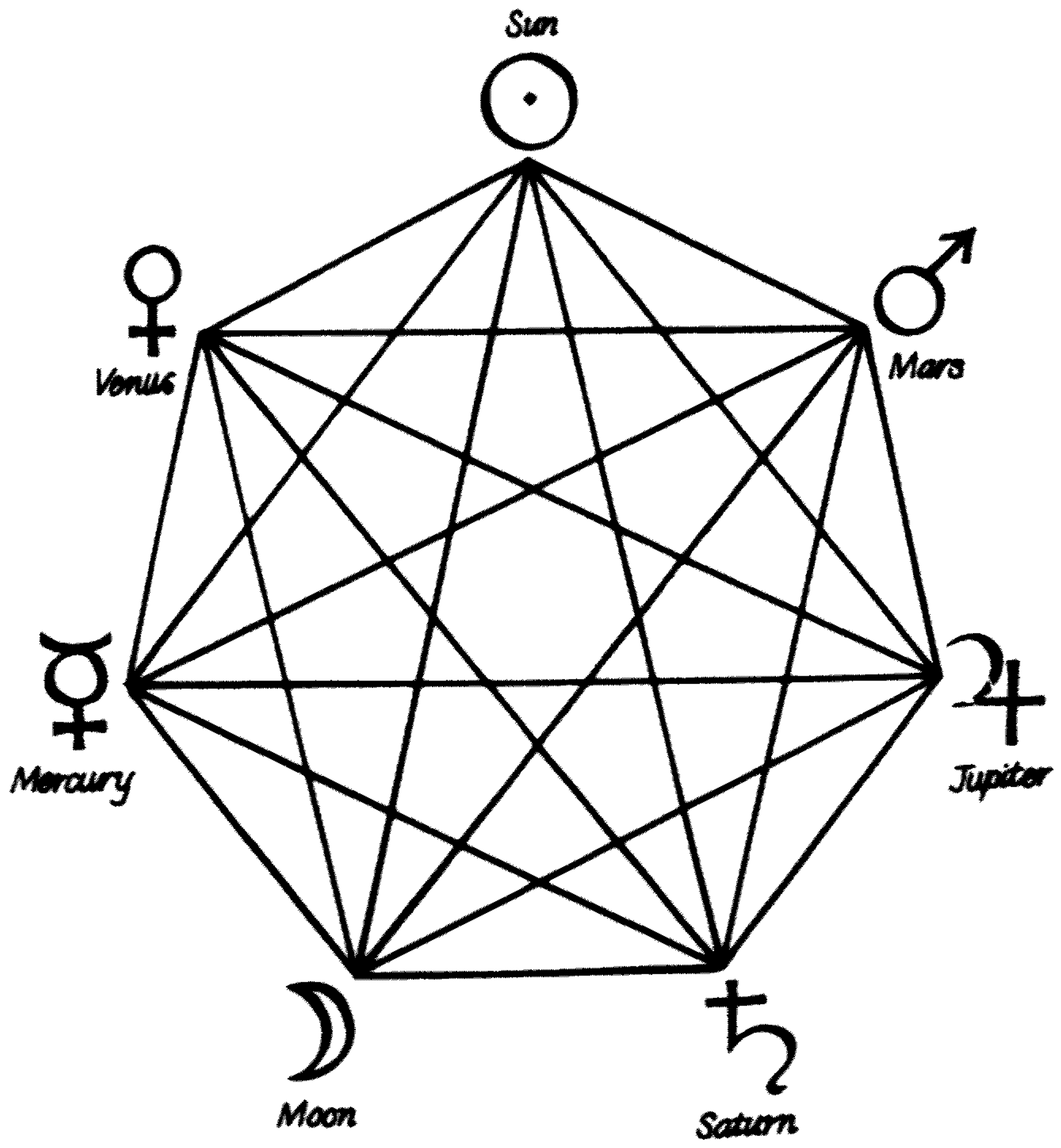

ll possible symmetrical
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If there have been certain recurrent patterns found to be 'useful' to mankind in quite diverse circumstances, the patterns observed outside 'in the world' were conceived as having their 'reality' within, in the psychological and spiritual dimension. This reflection inextricably related human nature to all other natures and was the basis of the sense of unity, in other words, the traditional principle of correspondence; this means that there are archetypal bases to which all the different manifestations owe their particular characteristics, and all realities were to be found in mankind.

To summarize: we are proposing that the megalithic temple-builders were naturally disposed, like so many other ancient peoples and civilizations, to lay out a pattern of his cosmos within which and from which he could gain greater understanding of his own position and role in the scheme of things. Such patterns incorporating significant numbers were the basis of his temples. And his temples in turn by embodying the archetypes help 'stabilize the world'.

'If the measurement of the Temple is in every way perfect, there will be perfection in the Universe as well.'
Mayamata, xxii, 92.

Callanis
View du

ter 4

Squaring the circle

Of the Onikare (sweat-lodge) of the Oglala Indians J. E. Brown says:

> **'It utilizes all the powers of the Universe; earth and the things which grow from the earth, water, fire and air. The willows which make the frame of the sweat-lodge are set in such a way that they mark the four quarters of the universe; thus the whole lodge is the universe in image. The round fire place in the centre of the sweat-lodge is the centre of the universe: "the ritual leader" makes an altar of the centre hole by placing tobacco at the four corners which are the cardinal directions.'**[1]

> **'In the solstitial rite of the "sun-dance" the Arapaho Indians build a great lodge, in the middle of which stands the sacred tree, representing the axis of the world. The lodge is constructed of twenty-eight pillars in a circle, and sustaining the rafters of the roof which meet the tree in the centre . . . the form of the Sanctuary is related to . . . the lunar cycle . . . the 28 pillars of the enclosure correspond to the 28 lunar mansions.'**
> *Titus Burkhardt*[2]

> **'No progress in ethnology will be achieved until scholars rid themselves once and for all of the curious notion that everything possesses history, until they realize that certain ideas and concepts are ultimate for man.'**
> *Paul Radin*[3]

4.1 The reconciliation of Heaven and Earth

During the execution of a plan to re-direct a road through the archaic earthworks of Durrington Walls in Shropshire recently, the excavations revealed foundation holes of a large archaic wooden structure. This structure has been likened to certain of the great timber lodges constructed by particular tribes of the indigenous peoples of North America, for so long misnamed American Indians.

We have accepted the technique of cross-cultural comparisons, having compared Asiatic shamanistic cosmologies with the numerical structure of certain British stone circles, thereby implying a possible connection with Neolithic British cosmology. Following our general thesis of archetypes we believe it is also permissible to compare another shamanistic cosmology, that of the original North Americans, due to their common ground in the importance attached to the cosmic cycles and the number of the planets.

The word planet, derived from the Greek, means wanderer and traditionally this group of seven moving lights are representative of 'heavenly' archetypes. These are the Moon, Mercury, Venus, the Sun, Mars, Jupiter and Saturn. From humanity's point of view on Earth, the Sun also moves across the background of the stars in the sky.

Because of the number of 'wanderers' in the heavens and the natural four-phase division of the twenty-eight day lunar cycle, we believe the number seven may have had for archaic Britons a similar traditional value to that of the Indian shamans of North America. We are not the first to make this comparison of archetypes. Titus Burkhardt, describing the ritual of the Arapaho Indians, says that these people 'build a great Lodge, in the middle of which stands the sacred tree, representing the axis of the world. The lodge is constructed of twenty-eight pillars erected in a circle, and sustaining the rafters of the roof which meet the tree in the centre. On the other hand the lodge of the Crow Indians is open above, while the space surrounding the central tree is divided into twelve sections in which the dancers take their places. In both cases the form of the sanctuary is related to two cycles, that of the sun and that of the moon. In the first case the lunar cycle is represented by the twenty-eight pillars of the enclosure, corresponding to the twenty-eight lunar mansions; in the second case it is represented by the twelve months. The rites accompanying the erection of the tree for the "sun-dance" show striking analogies with the Hindu rites connected with the erection of the sacrificial post, which is also the axis of the world and the cosmic tree.'[4]

The twenty-eight mansions of the moon relate to the quarters of seven-day weekly periods while the twelve relates to the zodiacal mansions and the double sixfold division of a circle. These fundamental numbers also reflect the primary triad of realms: the circle (hence the hexagon) symbolizes the realm of Heaven, the triangle symbolizes Mankind as the harmonizing human consciousness, and the square symbolizes the stability of Earth or physical experience.

The geometry of the stone 'circles' uncovered by Professor Thom embodies these three archetypal shapes. In all but the purely circular layouts the axes are long and short and establish a central 'squaring' whether or not this is related to the cardinal directions. The triangle is always present, either as a Pythagorean whole number triangle (as the three, four, five triangle) or as the rope needed to triangulate the drawing out of the ellipse. Finally, none of the enclosures move far away from the circle, as their perimeters are invariably some kind of closed curve, hence the definition of 'stone circle'.

If we move on to the more complex polygons as aspects of the numbers seven and nine it is as well to examine more closely the universal meaning of the unity of a 'sacred' space representing that which is situated outside time and outside space in a primordial state, 'prior' to space and temporally 'in the beginning'. Titus Burkhardt in his book, *Sacred Art East and West*, says that, 'spiritually speaking, a sanctuary is always situated at the centre of the world, and it is this that makes it a *sacratum* in the true sense of the word: in such a place man is protected from the indefinity of space and time, since it is

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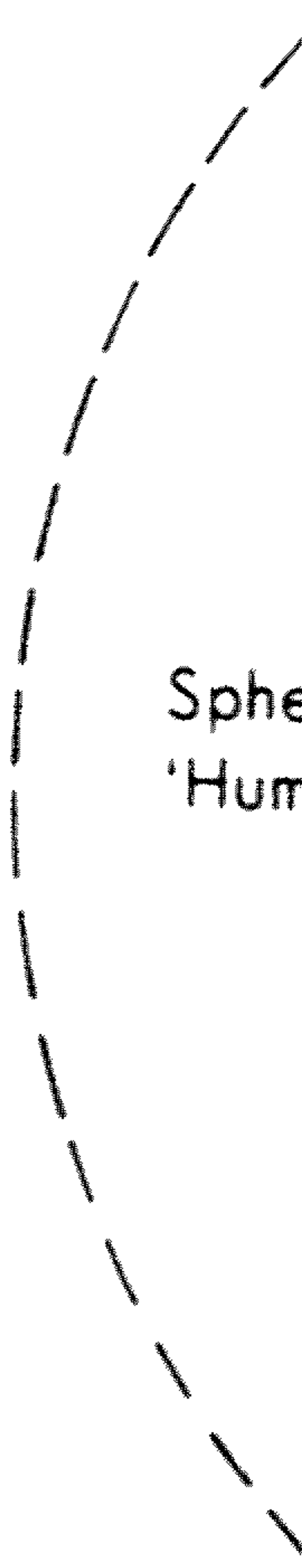

"here" and "now" that god is present to man.' Later he gives a most interesting insight into the deeper motivation as to the concern megalithic builders apparently showed for making rational whole numbers around the perimeters of their enclosures: 'whereas the spherical form of the sky is indefinite and is not accessible to any kind of measurement, the rectangular or cubical form of a sacred edifice expresses a positive and immutable law.'[5] Squaring the circle therefore represents the achieved equilibrium between Heaven and Earth.

Constantly recurring throughout the great majority of cultures of the world is reference to the relationship between mankind, as anthropos, and the cosmos. The reciprocal archetypes that are found to be animating or motivating natural phenomena are also found to be the inner motivations of humanity—hence the realization of the idea of correspondences and recognition in the Platonic doctrine of recollection. This complementary relationship of archetypal man and the cosmos is manifest in schematic form as the determinant of the proportions of the altar or altar and whole temple.

It is therefore a predominant feature of primary and traditional societies to hold an image of the Anthropos or archetypal symbol of humanity. This can be in the form of an ancestor figure or, as the Vitruvian man, as a paradigm for architectural proportions, or an Adam figure, or as in the Hindu tradition as Purusha.* In our illustration we have chosen the meditative sitting position to demonstrate the geometric symbolism of the three circles.

The three larger circles are centred on the root, symbolizing the earth, the heart, symbolizing mankind, and the crown of the head, symbolizing heaven.

In the 'inner' or smaller circles of the body the same symbolism is reflected within the subtle body. In the Vedic system the centres of the circles now lie

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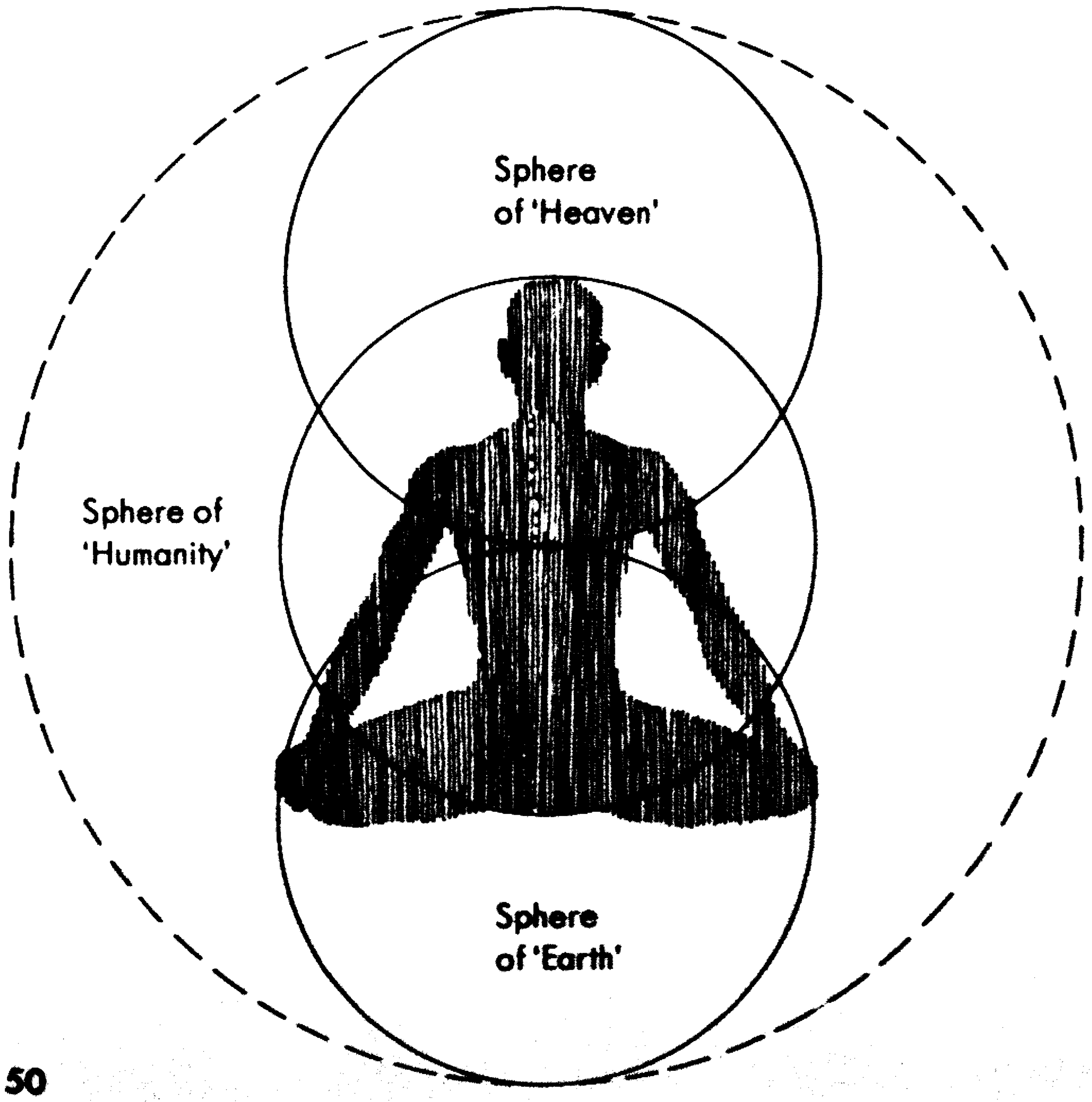
To reduce this image to a universal language we have chosen a geometric schema: one which is divided naturally into three, as the three reflecting domains, 'Heavenly' 'Earthly' and 'Humanly'.

50/51
The schema of the archetypal relationship between man and the cosmos.

50
The triad of 'greater' spheres.

51
The geometric symbols and 'inner' spheres.



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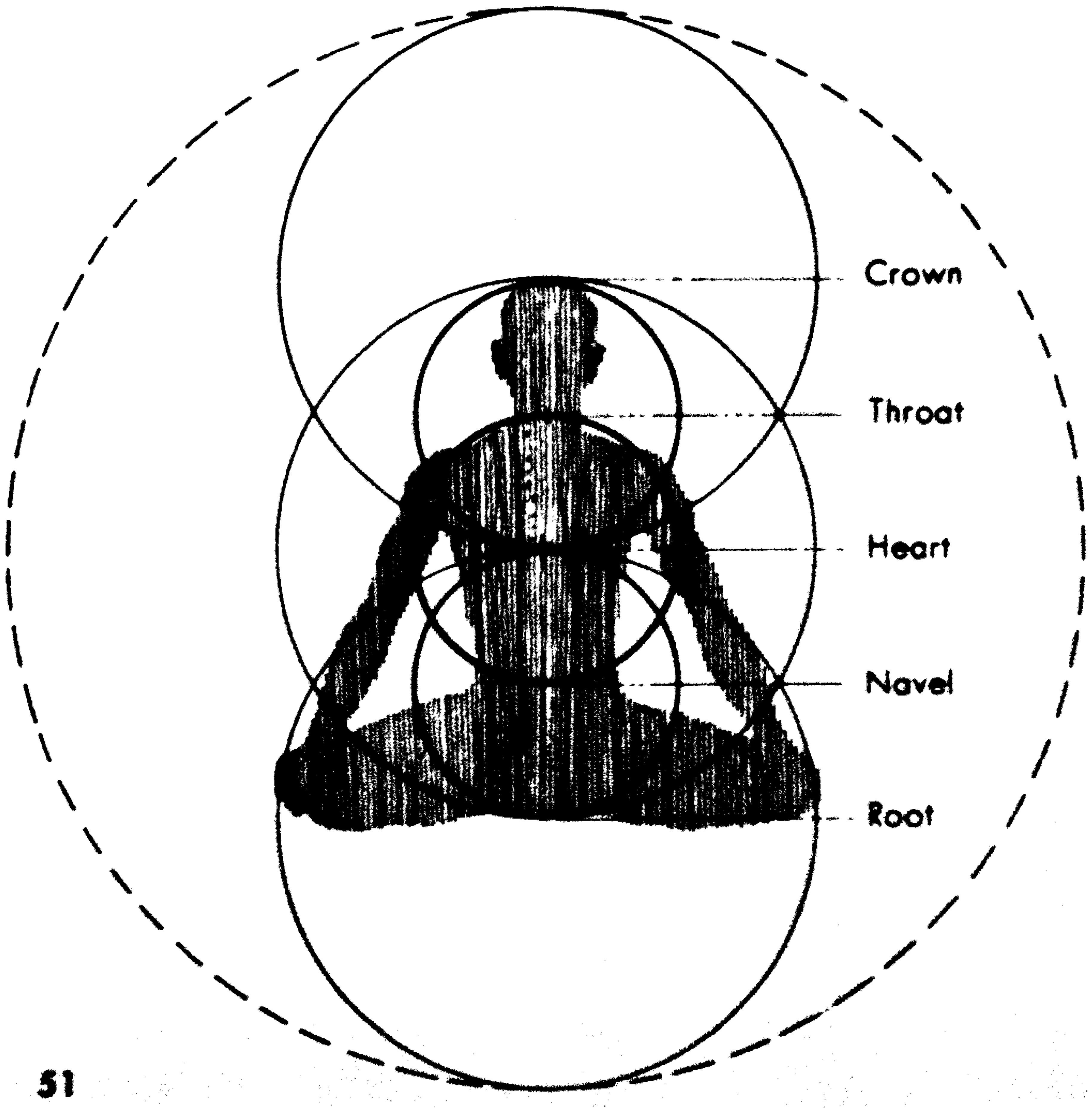

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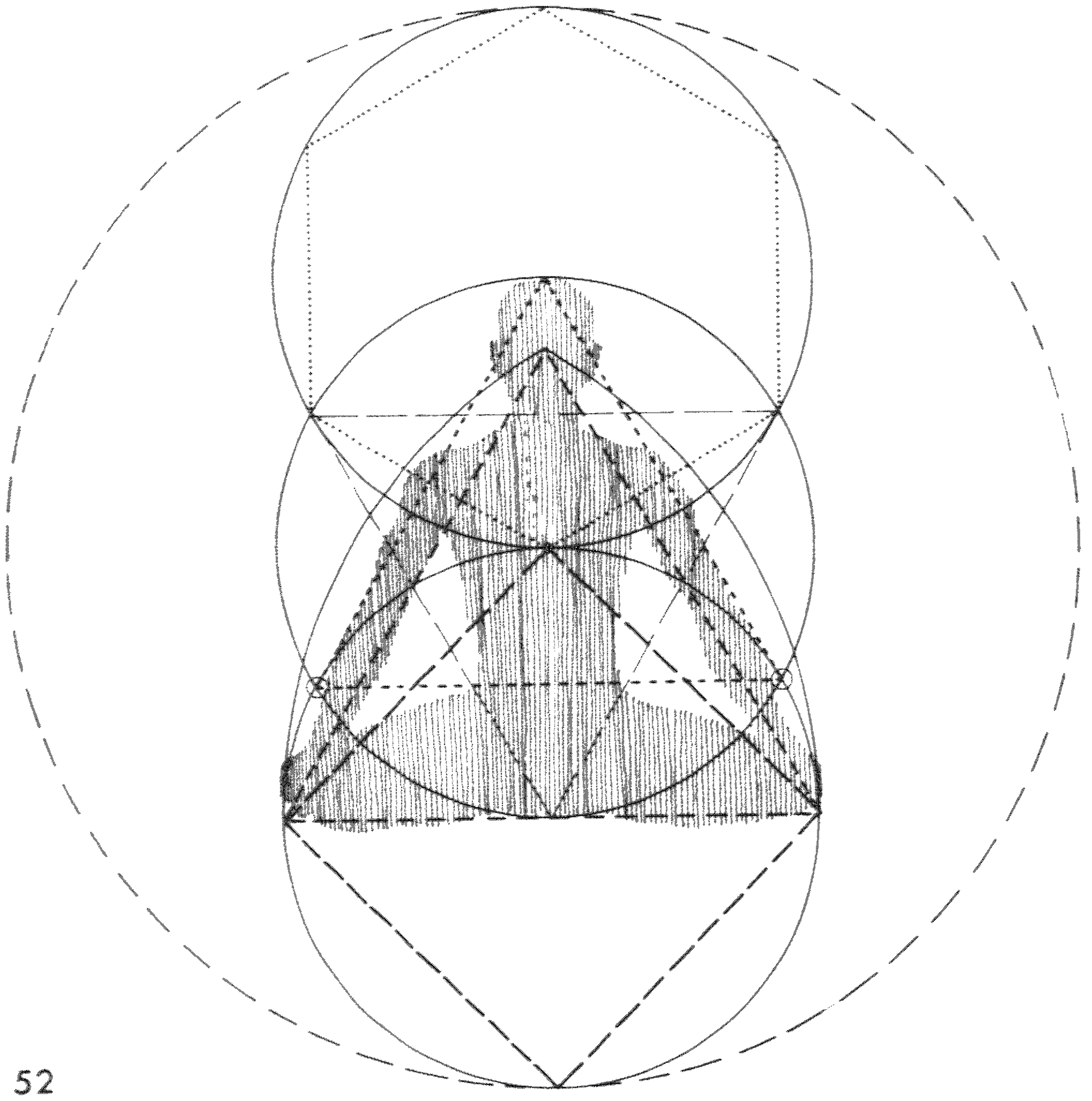

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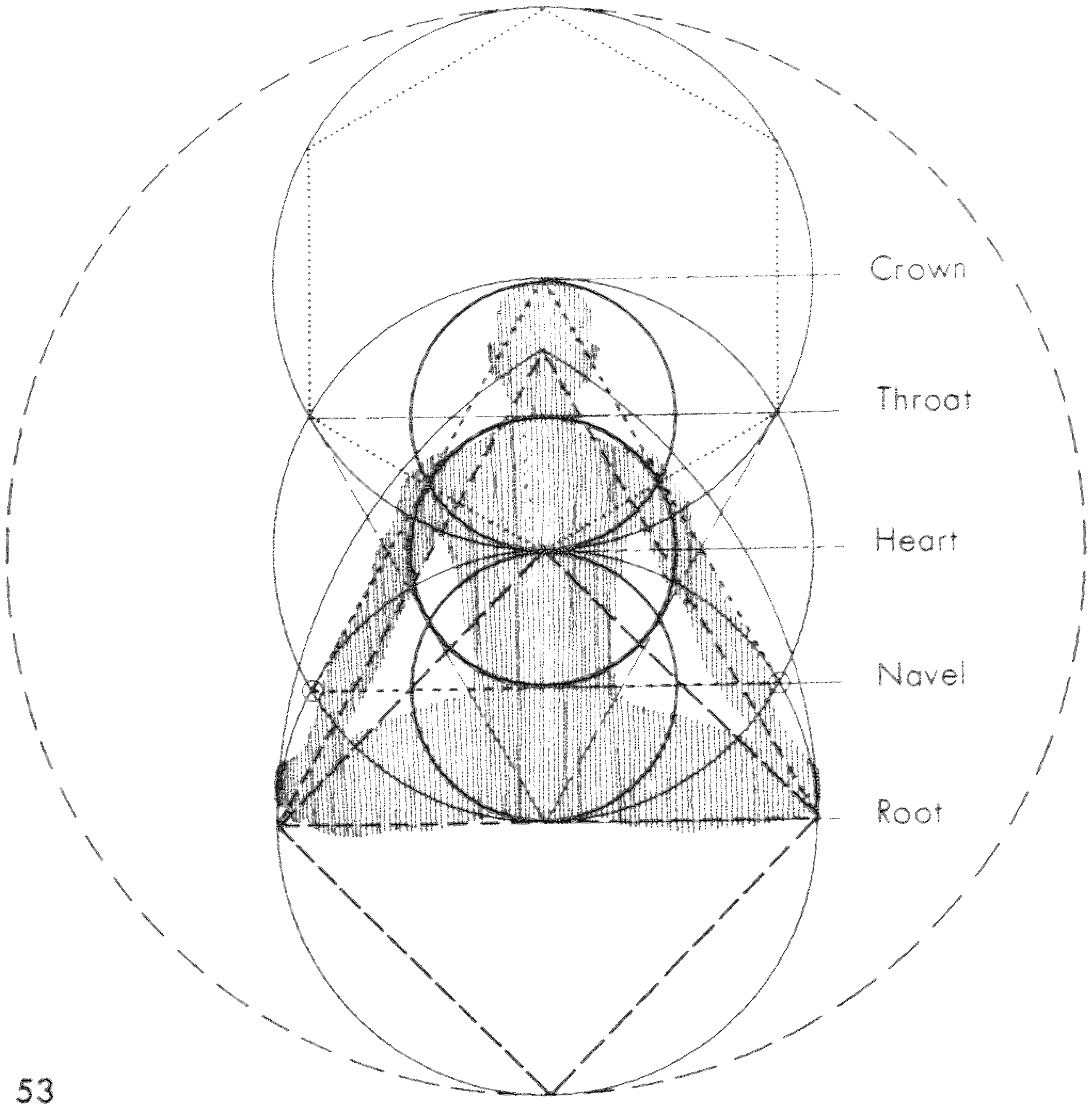

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52/53
Schematic developments of man/cosmos relationships.

52
The inner geometry of the 'greater' spheres square 'Earth Triangle of Humanity', Hexagon of 'Heaven'.

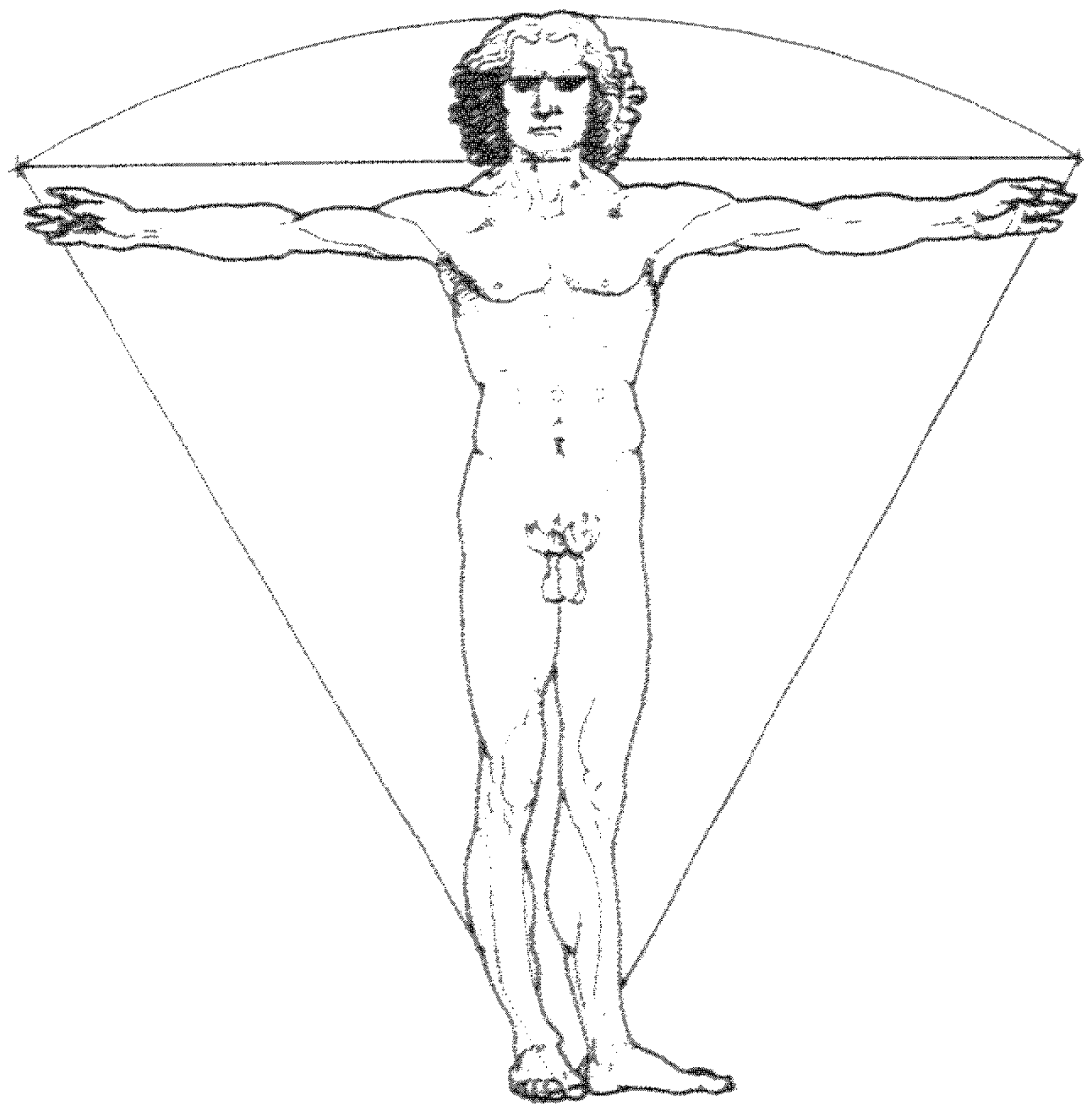
53
Full sequence of Heaven, Earth and Man relationships.

on what are called the navel, heart and throat centres with the base of the lower circle representing the root centre and the top of the upper circle the crown centre.

These same circles can be transposed into symbolic shapes which figure in the temple-building symbolism of Buddhist temples. The earthly is represented as a square (the four elements), the realm or circle of mankind is represented as a triangle (the three properties of consciousness – knower, known and knowing) and the upper circle of heaven is represented by the hexagon (the 'perfect' number 6). It can be seen that the equilateral triangle can take up two positions in the diagram which relates symbolically to 'shifts' in the centre of consciousness in the heavenward direction.

We find this law reflected in diverse cultures where a schematic human form is drawn in the proportions of either the altar or altar and temple. There are the continual hauntings of Leonardo da Vinci's Vitruvian man, ever with us, standing in a square and circle – uniting our two primary polar forms. In the Vedic tradition this figure is Purusha, who is the Divine Essence behind Man the builder, the altar and the fire of the altar. The concept of proportions deriving from this figure are enshrined for the Hindu temple builder in the Vāstu-Purusha-Mandala, a geometric formalization of Purusha as the immanent spirit of existence. This Mandala 'is an image of the laws governing the cosmos, to which mankind is subject as is the earth on which they build. In their activities as builders men order their environment in the same way as once in the past Brahma forced the undefined Purusha into a geometric form.'[6]

As we are dealing with Neolithic or basically 'settled' peoples, who could sacrifice so much of their economy to the building of these manifold stone structures, we may consider them proto-temples in the pure meaning of



54
Vitruvian man.

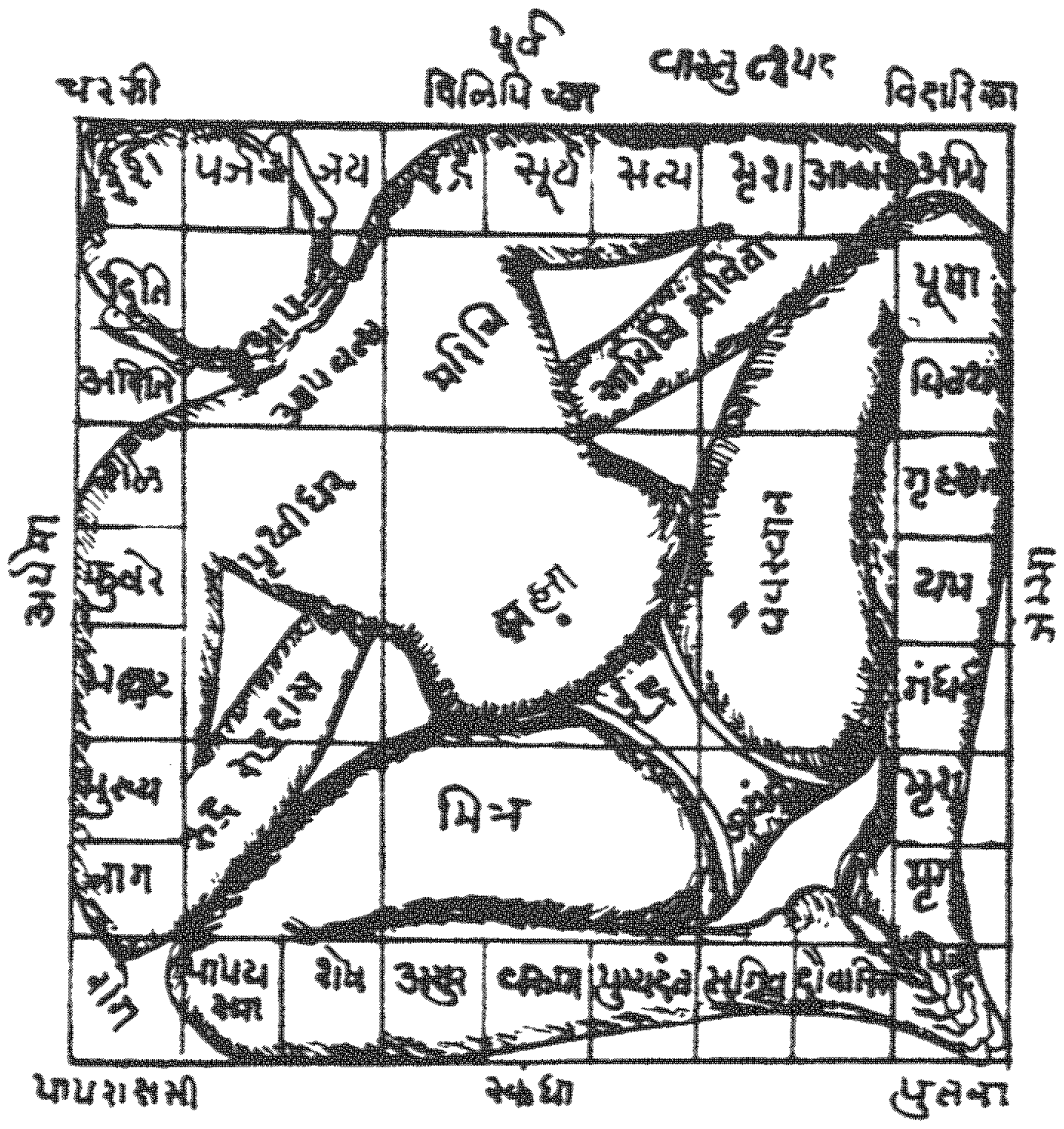
that term. Here we have 'concrete' expression of the nomadic circular form in transition to the sedentary square. It is in these great prototypes that we would expect to find the enshrinement of important archetypal patterns underlying the changing world, the permanent within the apparent.

In applying some basic principles of orientation and geometry described in the *Mānasāra Shilpa Shāstra* to the constructions of Castle Rigg and Long Meg's Daughters we found valid correspondence, even in the assumed procedure. We have seen how the division of six is inherent and fundamental to the circle (its own radius will always mark out six equal parts of its perimeter) and how this gives rise to the hexagon when these points are connected by straight lines. The most primary polygon, the triangle, arose from the intersection of the first two arcs in the east-west orientation procedure and was completed by connecting this intersection of the two circle centres with straight lines. Next, the square stabilized and fixed the site within the solar system by giving exact north, south, east and west positions, the four cardinal directions.

The constructions arrived at by Professor Thom for Castle Rigg and Long Meg were typical of those which numerically rationalize the perimeter of the primary circle. This balance between 'irrational' geometry and rational numbering is a fundamental reconciliation lying at the roots of sacred geometry. It is important to remember at this point that we are speaking horizontally, in terms of harmonizing the 'irrational' geometry with a whole number system in the plane of the earth. If we were talking in vertical symbolism, it would be necessary to take into account the existence of the irrational (chaotic and laval) underworld to complete the three realms – the other two being the rational world of mankind and the supra-rational world of archetypes.* The squaring of the circle is a perennial philosophical symbol: it is the establishing of Heaven on Earth and an act which informs as well as enforms that aspect of the cosmos which is furthest or most obscured from its archetypal source.

It is so commonplace for us today to experience the way in which even the most elementary pair of compasses will draw a circle that it is difficult to imagine the feelings of awe, mystery and power that this feat would have given our ancestors. Couple this with those sets of experiences which taught him that without changing the radius of his compass (or forked stick) he could complete a cycle in *seven* controlled moves and divide the original circle into exactly six. The seventh circle would complete the six-petalled flower pattern within the first. This hexagonal flower is culturally universal as it is precise, and we may speculate that the creation of this pattern established the perfection of the number six, which is also said to be 'perfect' because of its divisors totalling six: 1 + 2 + 3.

As there seems to be such an extreme difference between the circle, with its illusive numerically transcendental pi characteristic, and the square (the easiest area to measure), we would like to re-emphasize the fact that all regular polygons are embraced exactly by the circle. This makes it pre-eminently both a philosophic and geometric symbol of unity. The simple regular polygons are a profound study in themselves as they have been used by all philosophic and religious systems to represent facets of unity.



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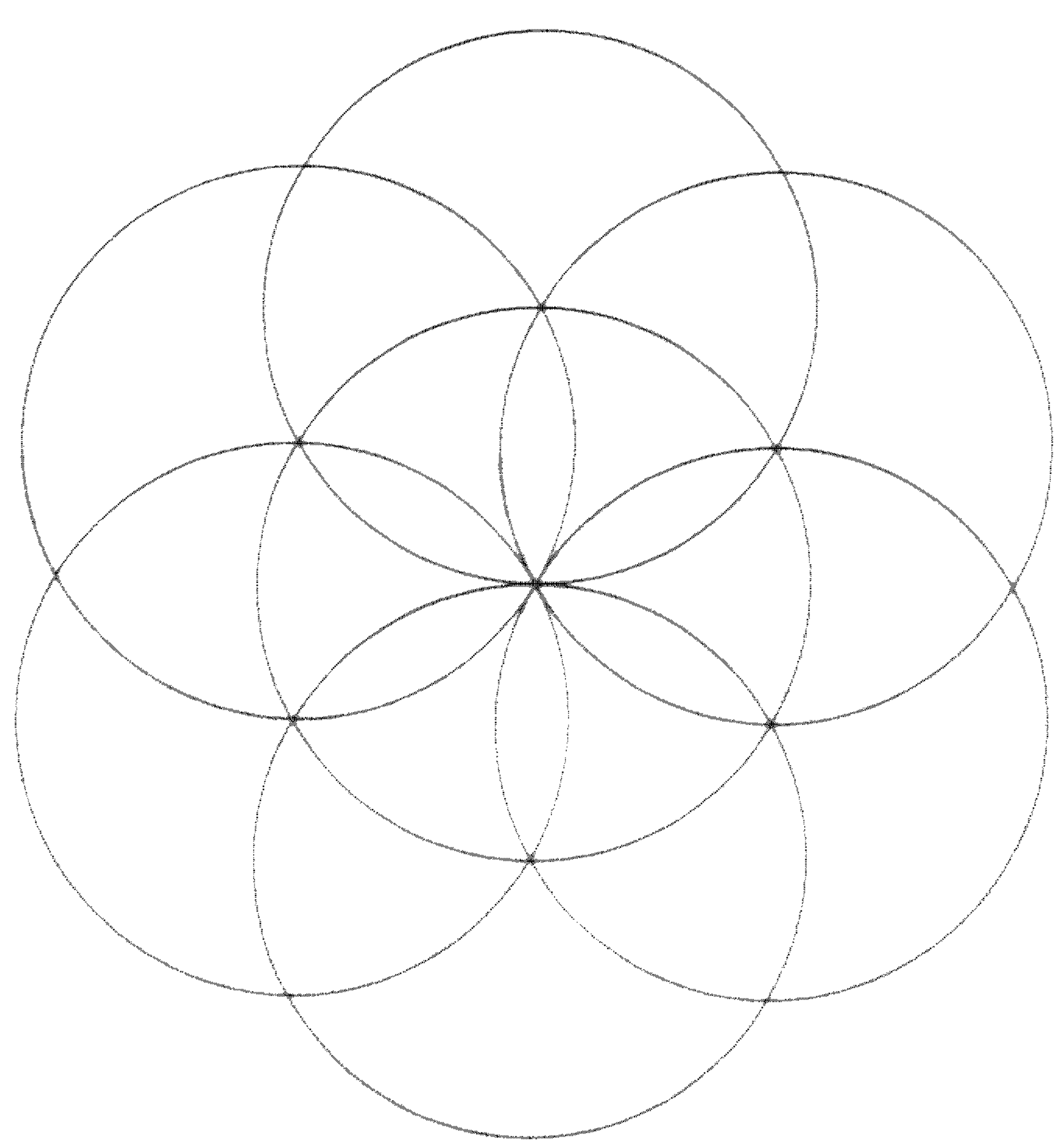
Purusha: the Vāstu-Purusha-Mandala.



56
The six-petalled flower pattern.

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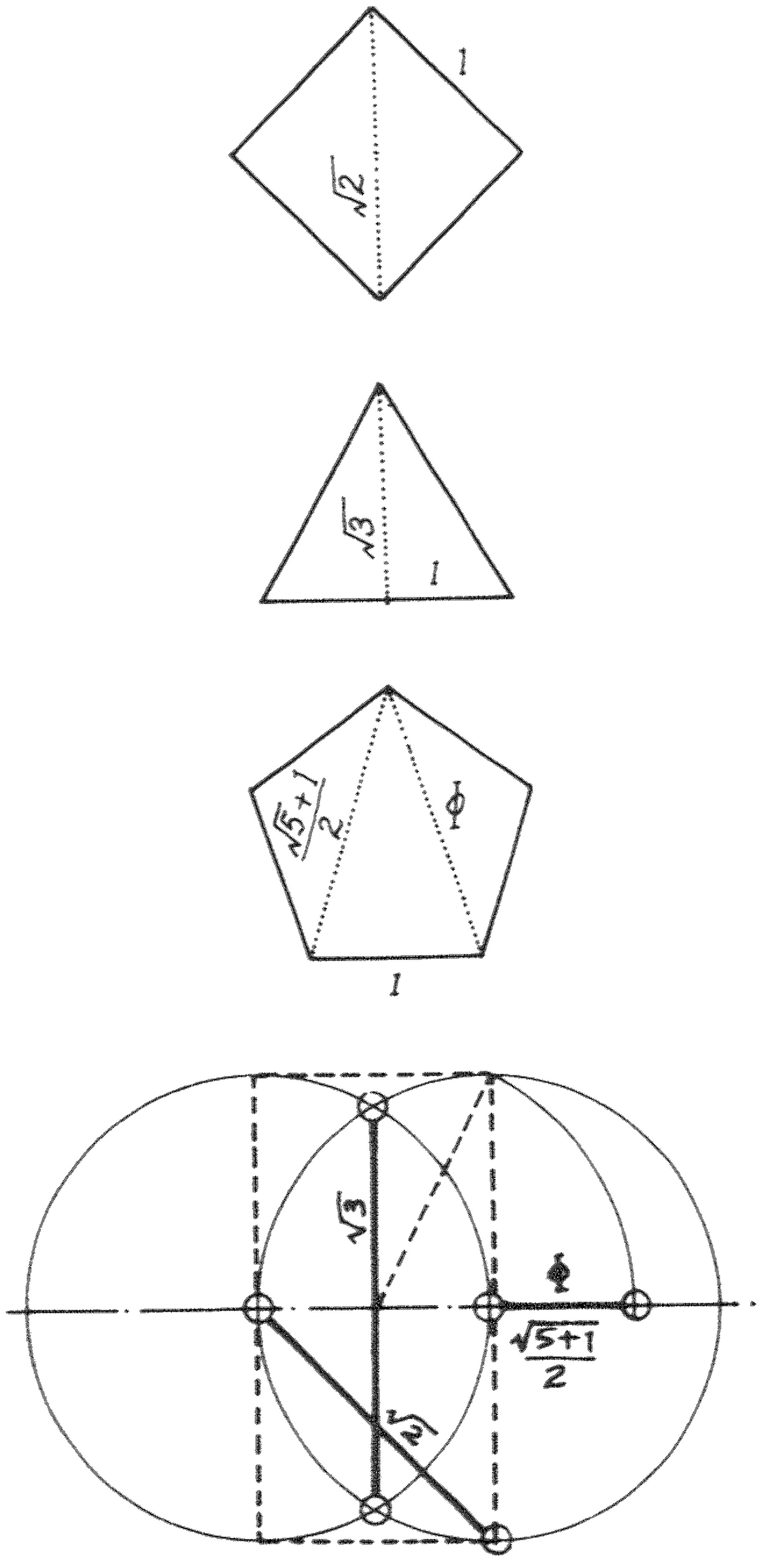
This is a constant issue in the use of terms. From the viewpoint of one realm the other is 'irrational' but from the viewpoint of the other realm this irrationality is supra-rationality or transcendental. In a similar way that intuition is supralogical in the correct usage of terms.

57
The proportional ratios: 'root' two, 'root' three and the 'golden mean'.



The squaring of the circle is sometimes presented as a geometric problem demanding that a square of equal perimeter or area should be found in relation to a given circle. At other times it is used to symbolize the virtually impossible task of making one order of things conform to another. Its real importance is that it works on many levels of both practical and psychological significance. In its most direct form the symbolism can be interpreted as the square of earth representing the sensorial order of the four elements, that which is measurable, whilst the circle, which has neither beginning nor end, symbolizes the perfection and timelessness of the archetypal realm, heaven. Squaring the circle can be taken to mean the establishment or maintenance of heaven on earth. In one sense this is a contradiction in terms; in another sense it recapitulates the essential truth that time depends on the timeless and that manifestation depends on its motivating principle. Principle formulates matter and matter expresses principle. Traditional societies see their task as regenerating and sustaining the world by the constant re-establishment of first principles through their rites, ceremonies and sacred structures: to live as the world lives by constant renewal.

The subject of incommensurables as transcendentals in mathematics has engaged many people over thousands of years and is vast in its ramifications. Whole numbers belong to one order of mathematics and because they have a precise quantity, are associated traditionally with the earthly order; by contradistinction transcendentals or incommensurables are related to proportional ratios, regular polygons, and the length of the perimeter of a circle – the inevitable pi. As incommensurables are strictly speaking *rational* it is therefore misleading to call them 'irrationals'; on the contrary they would be better described as supra-rational or transcendental because they are qualitative in nature like their associated polygons.

Special examples of the geometrical or proportional ratios which are incommensurable are the set of 'root' ratios, $\sqrt{2}:1$, $\sqrt{3}:1$, and $(\sqrt{5}+1)\div 2:1$, the Golden Mean ratio. These three special ratios are directly related in the above order to the triangle, square and pentagon. They recur consistently throughout the proportioning of the great sacred buildings of mankind. They can be taken to be of the same symbolic order as that of squaring the circle – rationalizing the irrational – unifying the paradox.

This symbolism of squaring the circle, or constructing an enclosure that partakes of both the incommensurability of pi in the circle and the whole-number measurability of the square, is clearly found in the British stone circles. This fact emerged through the findings of Professor Thom who shows that the flattening of the circles enabled the builders to achieve whole number perimeters. This flattening clearly indicated a heavenly form, the circle, moving toward an earthly form, the square.

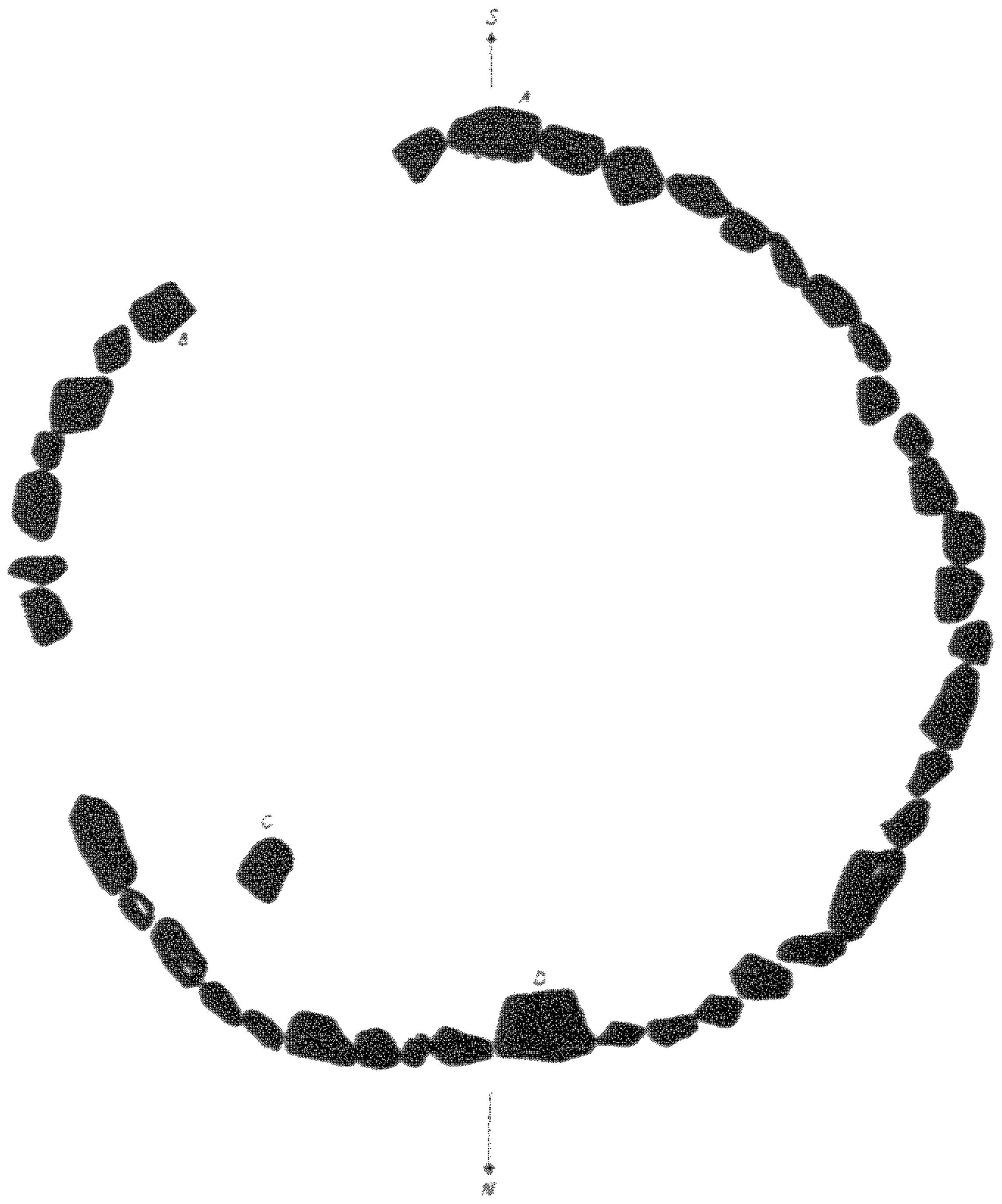
4.2 The Circle on the Hill of the Highest House – Moel Ty Uchaf

To take this point of symbolism in relation to the British stone circles, we will investigate in depth one of the particularly subtle and well-preserved examples: Moel Ty Uchaf.

In the remote mountainous foothills of the Bala region of North Wales, one of the most perfect settings in the British Isles, lies perhaps the most geometrically sophisticated of all the Neolithic structures. The overall setting of stones would fit within the great maze on the floor of Chartres cathedral, but the resonances from the cathedral-sized plateau on which this small circle sits echo all around the huge encompassing bowl of hills. These magnificent silent masses stretching back and away from the circle, to the south-east, form a huge horseshoe with a perimeter of five miles and rise to their highest point almost due south-east of the circle, the 2,572 foot high Bwrrd Arthur (seat of Arthur). Moel Ty Uchaf, which can be translated into The Hill of the Highest House, is described by Thom as one of the compound rings and represents a far more difficult achievement than those rings formed on the Pythagorean triangles. In the conclusion to his important volume *Megalithic Sites in Britain* he is drawn to remark how 'strange that the beauty of design achieved at Moel Ty Uchaf or Easter Delfour is not and cannot ever have been apparent on the site' and that he believes the 'designs with these properties probably took years of many men's time'. 'Perhaps' he adds, 'the proportions were worked out on the sands of the seashore, only to be expounded to the chosen few.'[7]

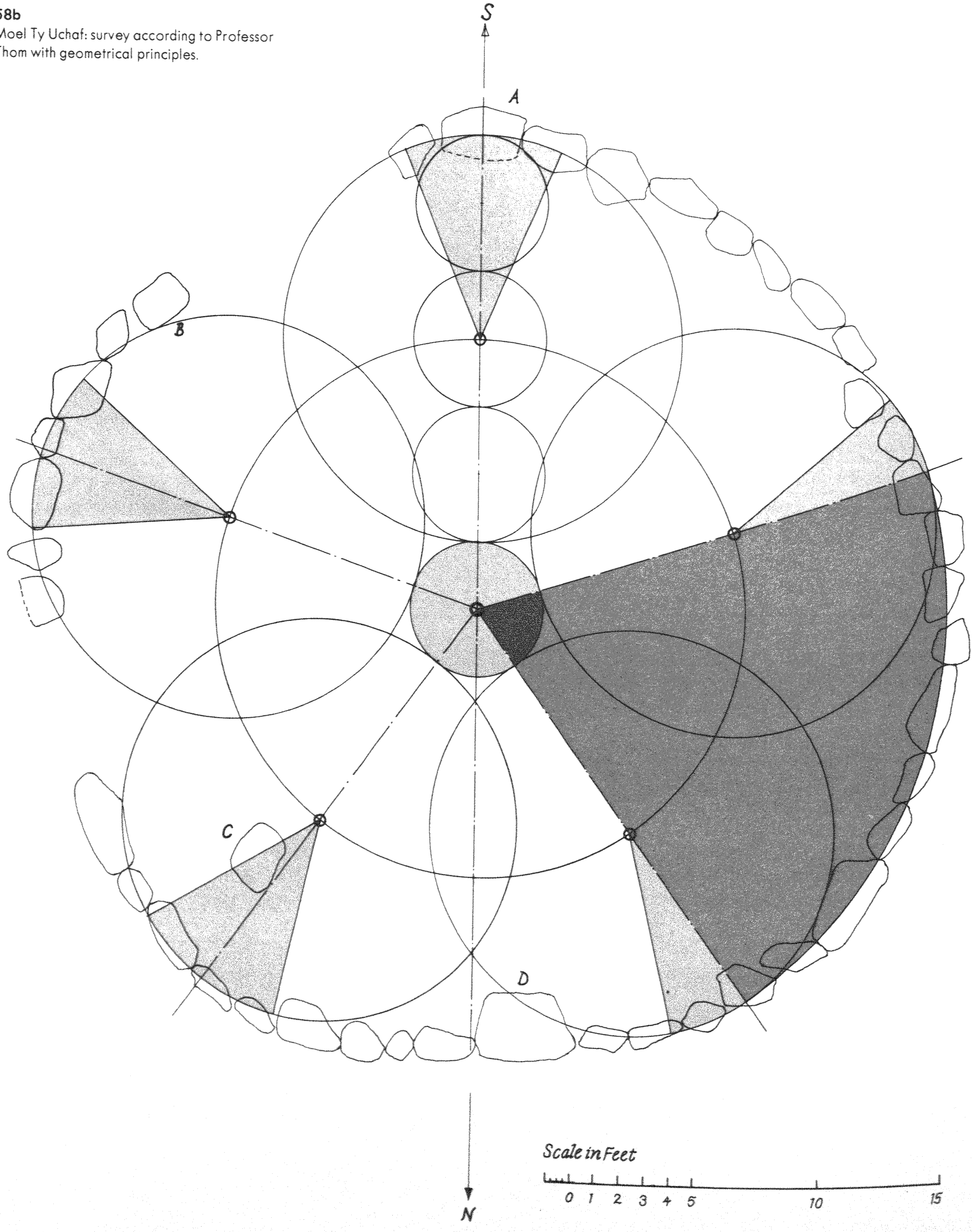
Moel Ty Uchaf in Merionethshire is under 40 feet at its greatest outer dimension, the girth of its three largest stones a mere four feet at their widest. The whole is an arrangement of 42 stones, one of which lies well within the enclosure. This does not include a centre stone which Thom believes to have been added at a later period. There are two gaps or entrances in the continuous encirclement which are symmetrical to the axis. The entrance to the east is four and a half feet smaller than the other which faces south-east. Thom's admiration for the accomplishment of the builders of this small but subtle temple layout is mainly based on his analysis of the manipulations of the megalithic measure. This he believes is founded on a 14 MY circle which would give an approximate 44 MY (43.9823) circumference, and by flattening four of the sides a 42½ MY circumference is arrived at. The reason for this subtlety, according to Thom, is that the builders required a circumference with rational increments of 2½ MYs. He discovered that the symmetry chosen to accomplish this was a perfect pentagon of five centres on the circumference of the inside determining circle which has a diameter of 8 MY.

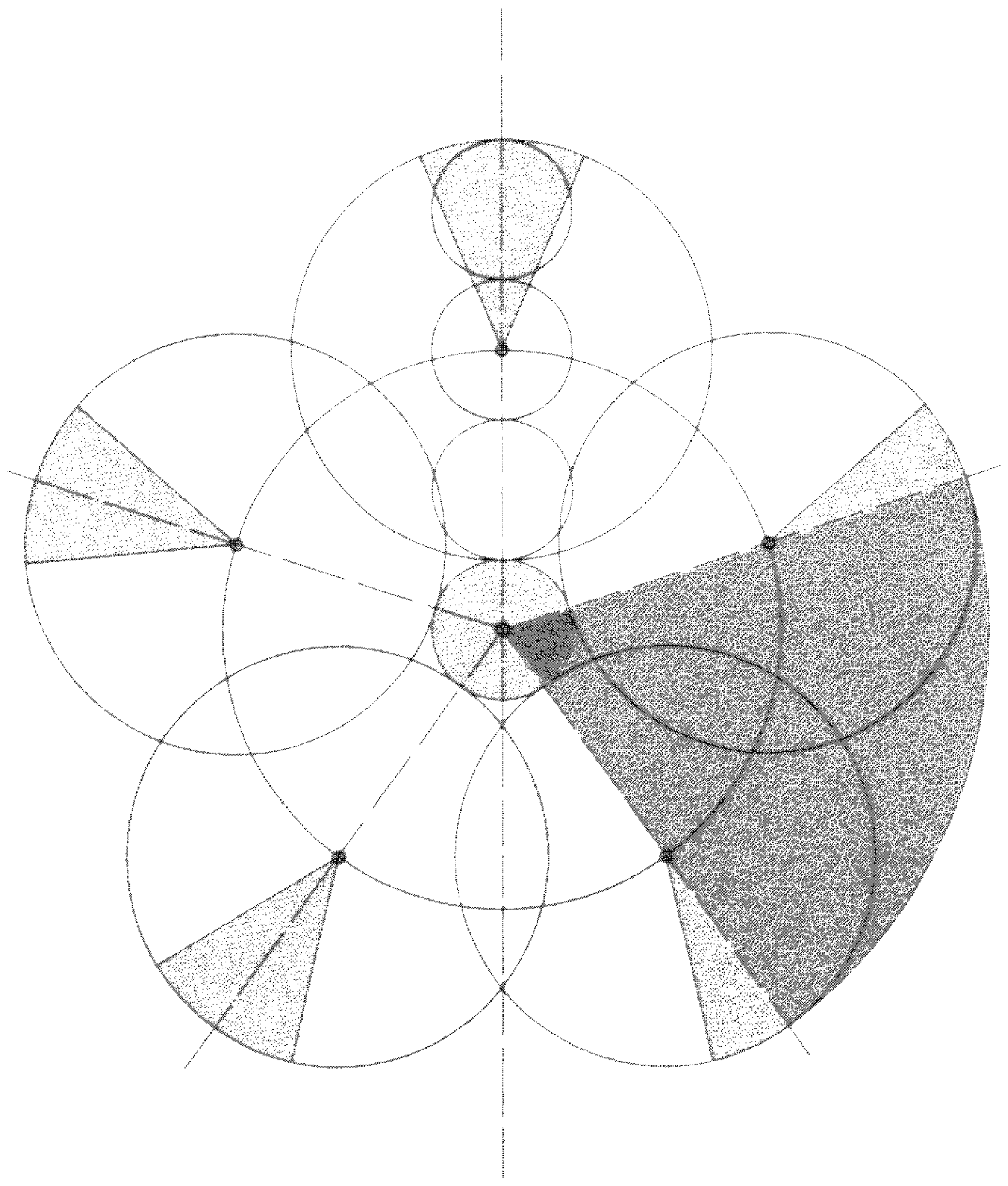
To account for this preference for the pentagonal division he cites the azimuth of the rising Deneb – which is actually 17.3° whereas the orientation of the circle is 18° (the pentagonal angle is one-fifth of 90°). Despite this small discrepancy Thom considers the siting a great achievement. Having established this relationship he thus found a beautiful fivefold symmetry for constructing the flattening of four of the sides, the flattening which gave the necessary outer perimeter of 42½ MY.



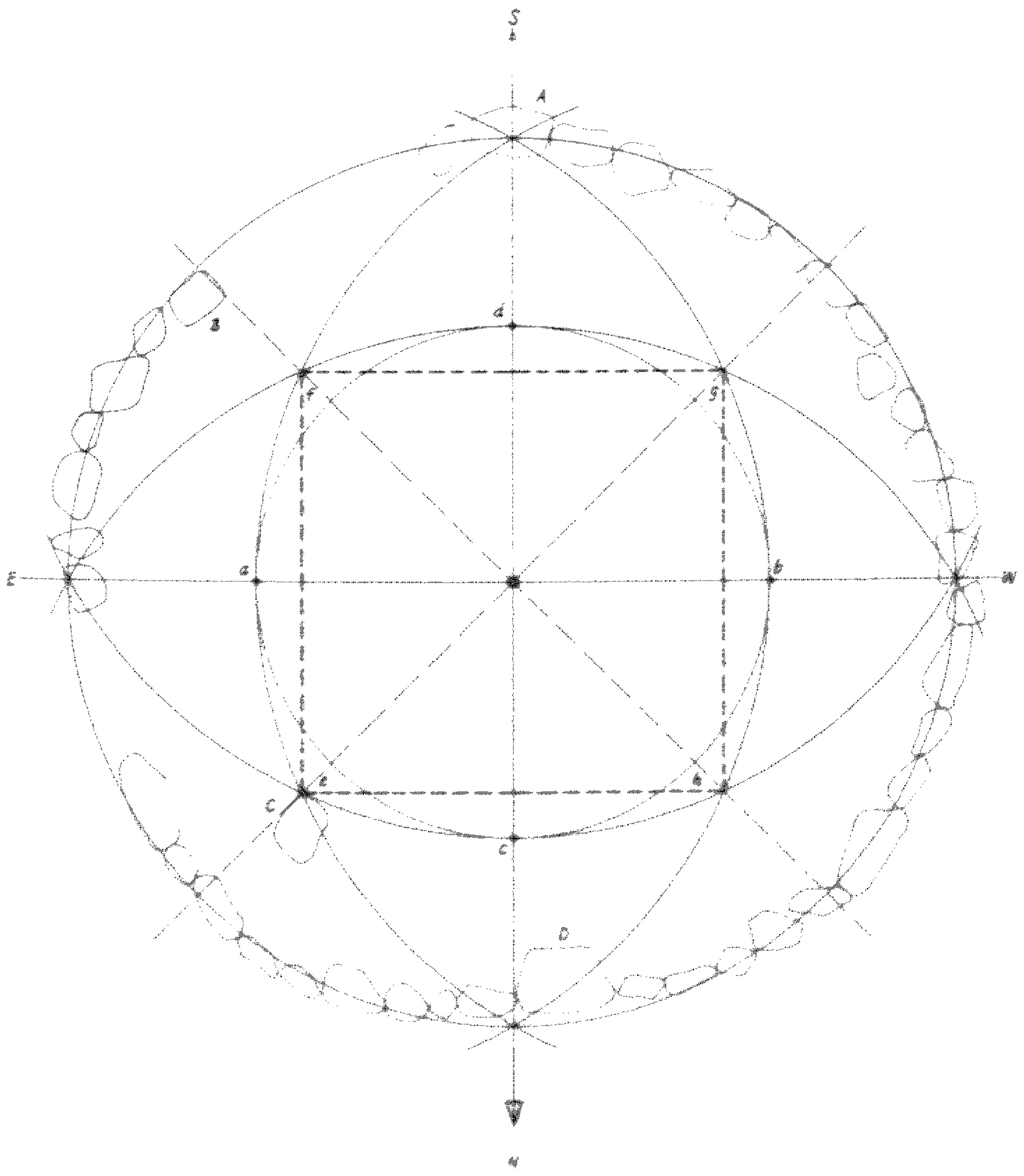
58a
Moel Ty Uchaf: survey after Professor Thom.

58b
Moel Ty Uchaf: survey according to Professor Thom with geometrical principles.





59
Professor Thom's proposed basic geometry for the layout of Moel Ty Uchaf showing the fivefold symmetry together with the 1/5th segment of a circle below (toned). The smaller toned areas are the segments of the circles used to determine the smaller perimeter curves – in Thom's opinion 'to establish a rational whole number perimeter'.



60
The orientation procedures of the *Mānasāra Shilpa Shāstra* as applied to Moel Ty Uchaf.

It is fascinating that when we come to look closely at the final pattern we see that the nearest overall symmetry to the whole construction is 90° to the Deneb azimuth. This is because it is to the west-north-west that the pentagonal outline has a full segment of a circle. Not only this but the 'apex' of the pentagon opposite has seven stones almost symmetrically placed either side of the axis. It is through this larger opening we would expect any sightings of the most southerly rising moon and midwinter rising sun to have been made, possibly with calibrated stakes across the openings, but these observations are without verification at present.

We now propose to repeat orientational procedures according to the Vedic tradition, bearing in mind Thom's warning that an upright gnomon was unlikely to have been used due to the mountainous horizon. It is within the bounds of possibility that the architects of the circle might have used a small 'table' of slate (an abundant local resource here) to perform a miniature orientational ceremony at the solstice. In this case a table could have been arranged and corrected with a water level so that sightings could be made in miniature to compensate for the irregularities of the actual horizon.

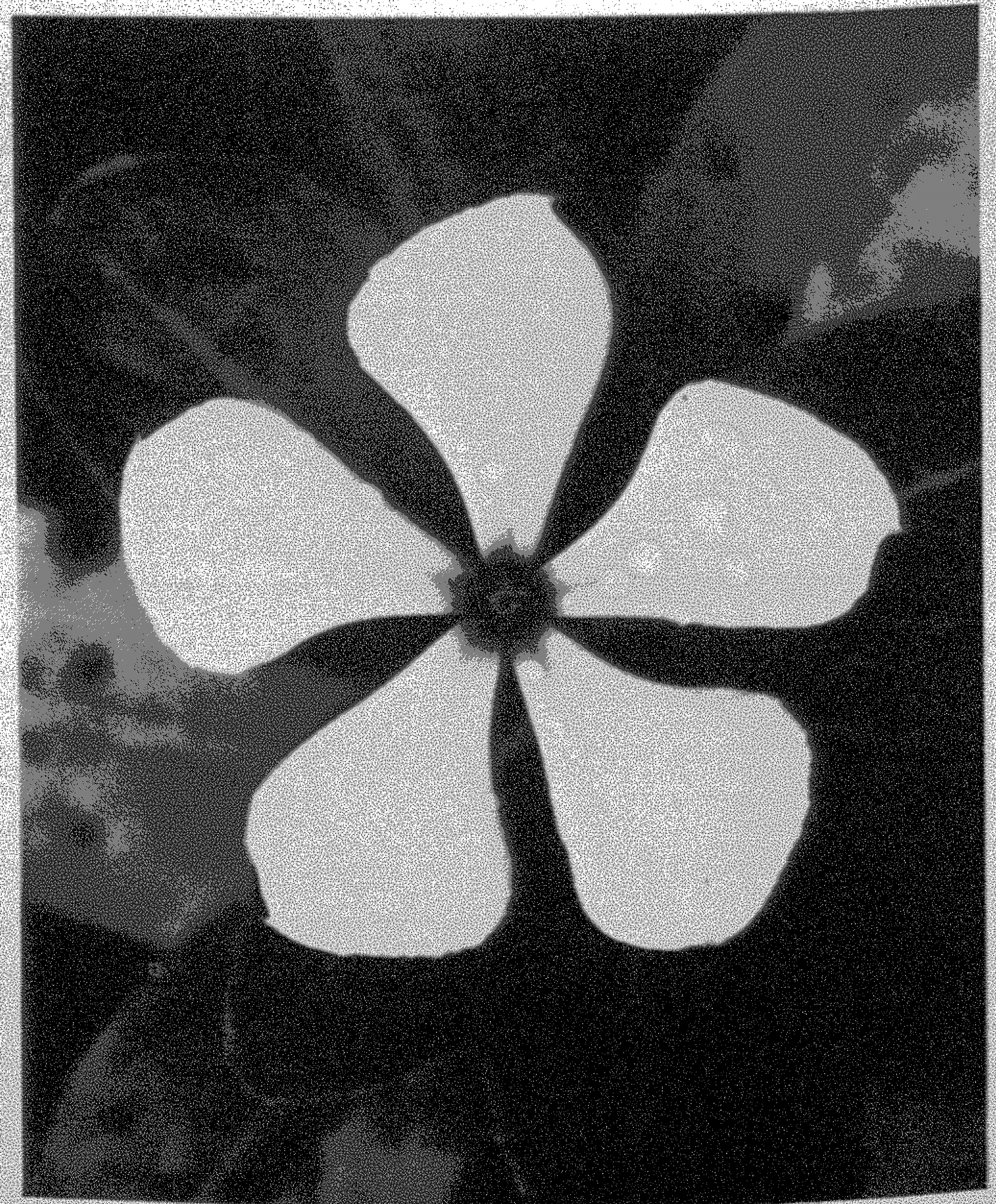
Accepting Thom's proposed initial circle of 8 MY diameter as the first geometrical act, we can also take this as the primary circle according to the *Mānasāra Shilpa Shāstra* method. After having obtained the east and west axes from the centre pole shadow the next part of the ritual, that of obtaining the solar cross, might follow a similar procedure: if we take point **a** on the eastern side of our central circle and make our radius the diameter of the primary circle we can inscribe an arc both ways from point **b** to the north and south. Similarly from point **b** as centre we can complete the 'fish' form and establish our north-south axis: this axis cuts the primary circle at points **c** and **d**. These two points become the centres for the east-west fish form, exactly crossing the first. We now have four points outside the original circle whose distance from the centre of that circle will be measured in incommensurable numbers as they are established from a geometric proportion by which the length of the longer axis, say north point to south point is $\sqrt{3}$ in relation to the diameter of our primary circle, taken as unity. What is most interesting is that if we draw a circle through these points (N, S, E and W) we obtain a circle which is only about 3 inches larger in diameter than Thom's proposed 14 MY circle! In other words this may have been a reduction from the proportional, to the numerically rational, as part of the symbolic ritual of squaring the circle.

In terms of the Hindu practice, certain points (*marmas*) are contained 'within' the stones and certain others are to be found within the space of a sacred building.[8] Here we have a proportional circle prior to the reduction to 14 MY intersecting all but five of the 41 bounding stones: hence in this sense it too is embodied in the construction. The next stage in the Hindu procedure is to 'square' the primary circle by joining the intersections of the fish form: when we do this by joining **e**, **f**, **g** and **h** we find a most accommodating reason for the single stone within the area, designated stone **C**. The 45° axis or diagonal of the square not only tangents this stone but the corner of the square itself terminates right beside the stone. Thom has called parallel phenomena the universal rule of being not on the centre but beside, it which also conforms with those *marmas* that must not be built on in the Hindu system. If we follow the other diagonal from **h** through **f** it continues until it tangents the stone designated **B** which is one side of the south-east gap. This analysis demonstrates that the three most venerated architectural proportional systems are embodied in this proto-temple.

Now we have to decide whether or not to follow Professor Thom in his belief that it is unlikely that Neolithic man knew the construction of the pentagon, which was not recorded officially until more than a thousand years later (by Euclid in *Magna Graecea*). However, we believe that the need for these early mathematician-astronomer-architects to establish a fivefold temple would have led them to discover the secret of dividing a circle into five. Conversely, having discovered the secret of the fivefold division of a circle, they applied it to their temple building.

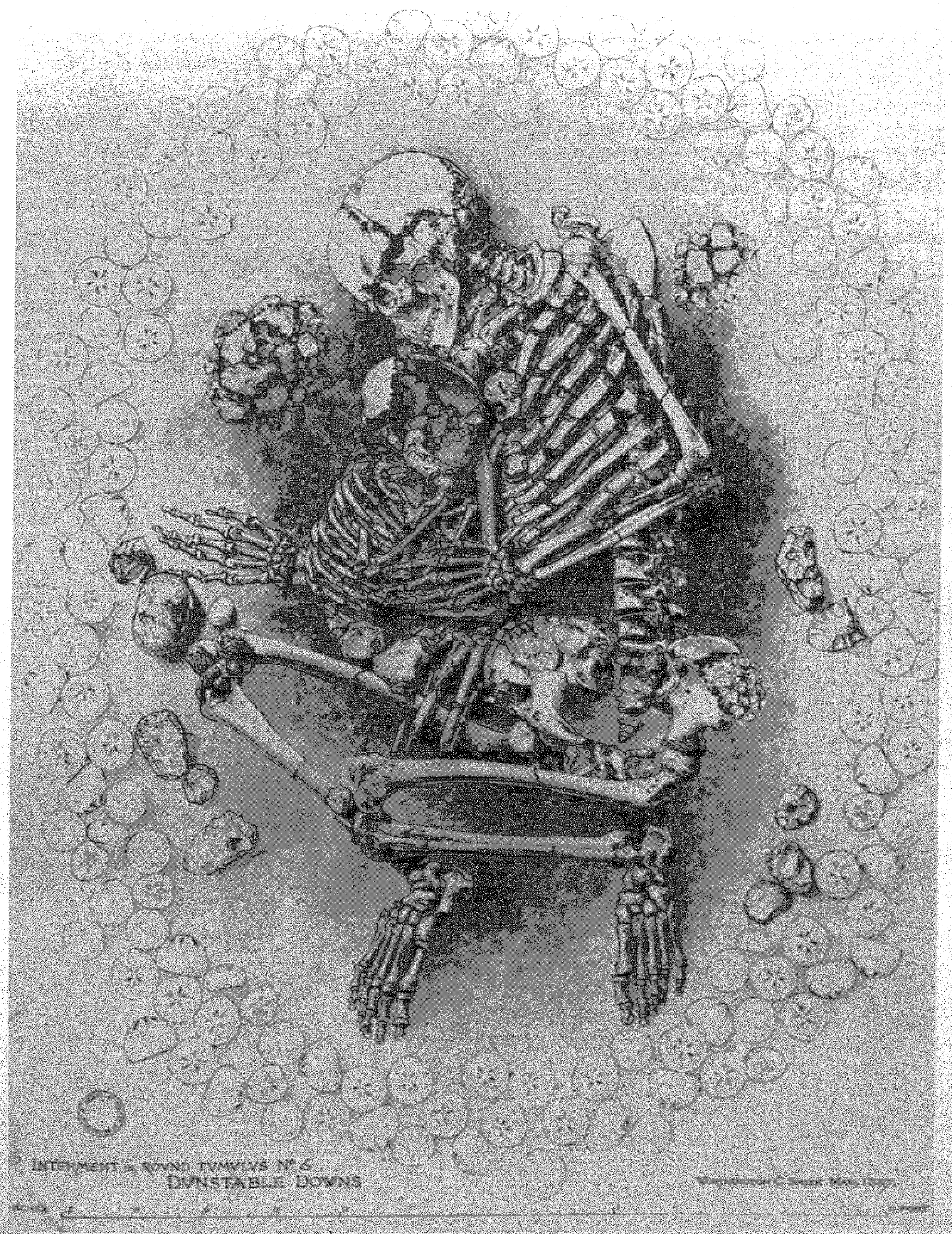
It is very hard to imagine the sense of the miraculous that the discovery would have impressed on these early geometers, because the procedure is as simple as it is elusive and as elusive as it is precise and powerful. The face of almost every wild flower and herb that they confronted, from the buttercup to the periwinkle, would have challenged them to solve the riddle of how to make a fivefold division of a whole. Further evidence of the archaic Britons being fascinated by fivefold symmetry is the careful arrangement of pentagonal fossilized sea urchin shells found arranged around the skeletons in a circle during the excavations of the Barrow at Dunstable Down and all so faithfully illustrated by W. G. Smith.

61
The fivefold symmetry of the buttercup.



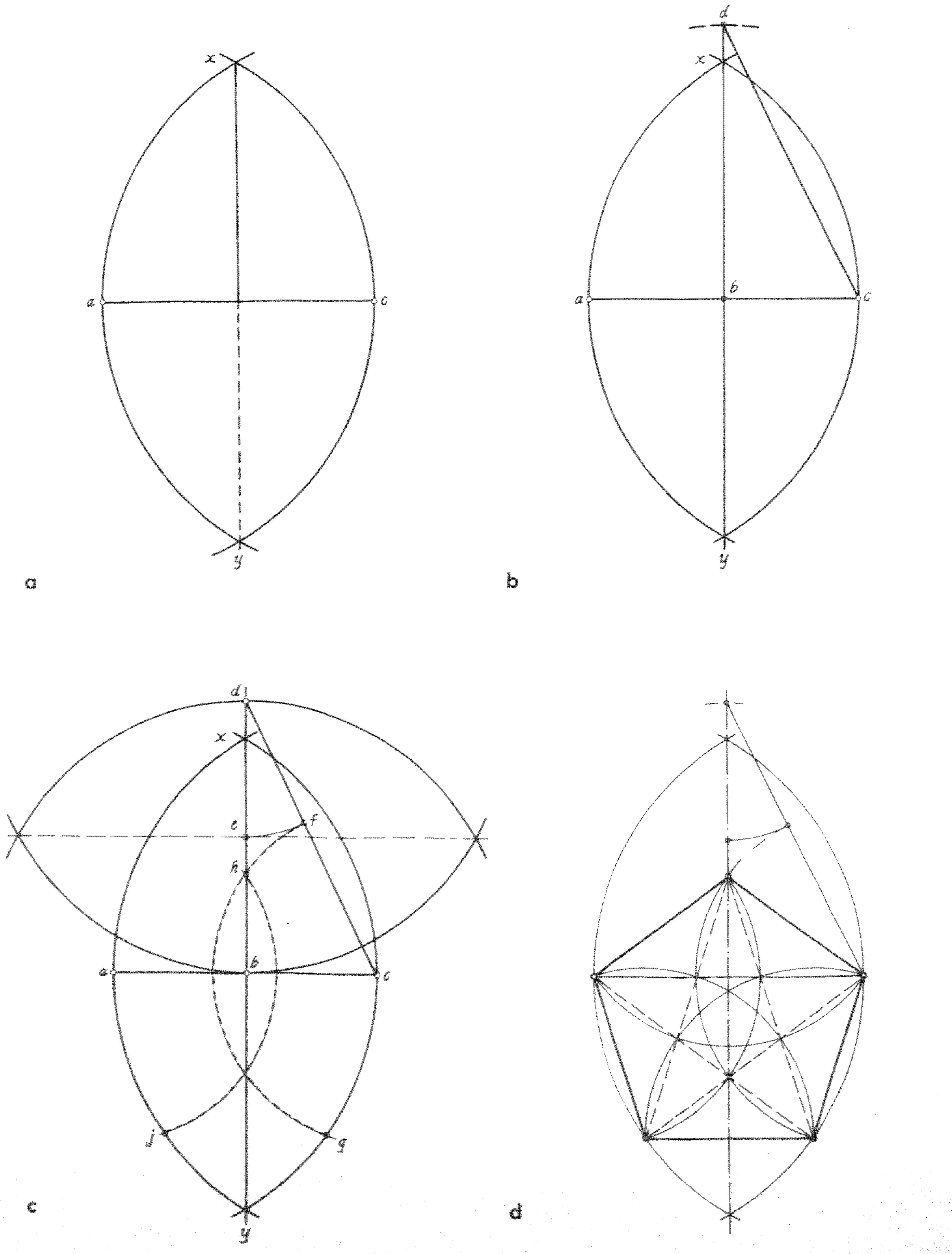
62
The fivefold symmetry of the periwinkle.
(Courtesy John Shaw: Bruce Coleman Ltd.)

63
Crouched burial in the round tumulus on Dunstable Downs. (Ink and wash drawing by Worthington G. Smith, 1887.)


INTERMENT IN ROVND TVMVLVS No 6.
DVNSTABLE DOWNS
WORTHINGTON G. SMITH. MAR. 1887.
INCHES 12
6 FEET

We have drawn out the procedure (fig. 64a) that we expect would have been followed had the builders known this secret. Starting with a primary arc drawn with centre **c** and radius **ca**, the next operation is to place the trammel centre at **a** and without changing the radius cut the primary arc with a second one which cuts the first at points **x** and **y**. By joining **x** and **y** with a straight line (a cord in this case) point **b** midway between **c** and **a** is established. With centre **b** and radius **ca** point **d** is established (fig. 64b) on the extension of **bx**.

Next we construct a vesica from **b** and **d** respectively which bisects **bd** at **e** (fig. 64c). Taking **d** as a centre and with radius **de** we cut **dc** at **f**. With centre **c** and radius **cf** we draw an arc through to **g**. Then with the same radius and centre **a** we cut a similar arc from point **h** to point **j**. Point **h** is then the apex of a regular pentagon **hcgja** (fig. 64d).



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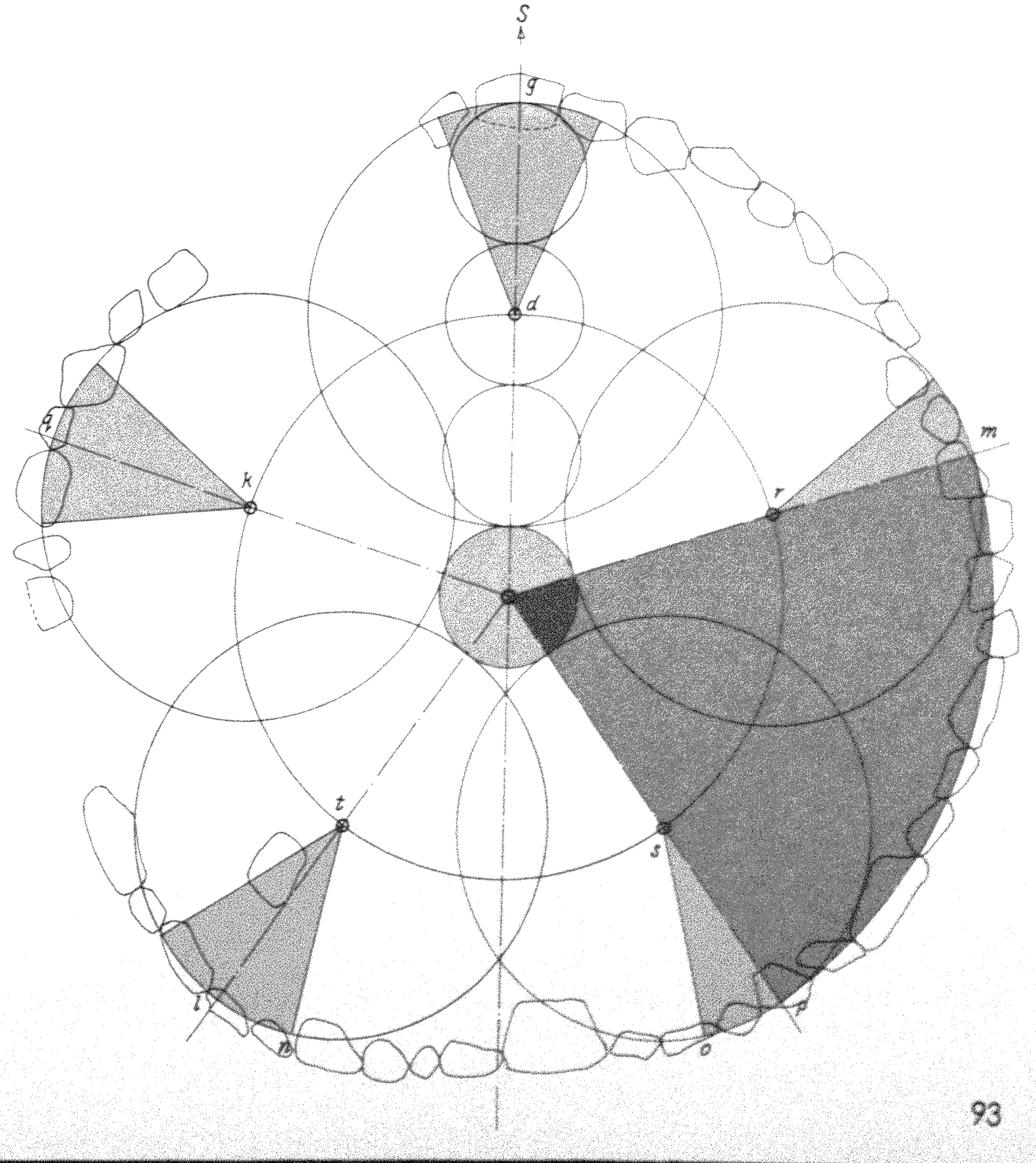
A method of constructing a pentagon from the vesica pisces.

Returning to our study of Moel Ty Uchaf our drawing demonstrates the relationship between a smaller centre circle of one MY radius (shaded) and the fully drawn five outer circles. We have also shaded in the actual amount of each of those smaller circles used in the outer perimeter layout as proposed by Professor Thom. It is in the pattern of these shaded segments that the true bilateral symmetry becomes apparent—with point **k** as a pentagonal apex the opposite two circles have segments only half the size. Using the centre circle of one MY as a module we have continued inscribing these modules up the central axis to **g**, showing the numerically rational increments to the perimeter of Thom's geometry.

Using point **d** as a centre with a radius of 1½ MY we can draw a circle which passes through **g** and just touches our centre 1 MY module circle. We proceed to draw the same size circles centres **r**, **s**, **t** and **k**, each of these circles touching the circumference of the shaded module circle.

Starting from the centre of our module circle we draw central lines of symmetry through points **r**, **s**, **t** and **k** which cut our larger circles at points **m**, **p**, **l** and **q**. These points, with the exception of **q**, are the centres of the flattened curves of the whole temple's perimeter geometry. In the case of **g**, which is typical of **m**, **l** and **p** as centres, we proceed to draw a line through **s** to **o** and through **t** to **n**; with centre **g** the arc **no** is drawn opening out to the



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Geometrical analysis of Moel Ty Uchaf.